VOL. LXI MAY, 1922 NEW SERIES VOL. 14, NO. 2

JOURNAL of the American Veterinary Medical Association

FORMERLY
AMERICAN VETERINARY REVIEW
(Original Official Organ U. S. Vet. Med. Assn.)
EDITED AND PUBLISHED FOR
The American Veterinary Medical Association

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THE JOURNAL OF THE AMERICAN VETERINARY MEDICAL ASSOCIATION is issued the first of each month. *Manuscripts and copy for insertion should be as nearly perfect as possible for the printer and should be received by the tenth of the preceding month to insure insertion in the next month's issue.* Volumes begin in April and October.

Communications relating to publication, subscription, advertisements and remittances should be addressed to JOURNAL OF THE AMERICAN VETERINARY MEDICAL ASSOCIATION, 1629 Hobart Street, Washington, D. C. Matters pertaining to the American Veterinary Medical Association and membership should be sent to Dr. N. S. Mayo, Secretary, 4758 Ravenswood Avenue, Chicago, Illinois.

$6.00 per annum Foreign $5.50; Canada $4.25 Single Copies 60 cts. in U. S.

Entered as Second-Class Matter, February 4, 1925, at the Post Office at Washington, D. C., under Act of March 3, 1879. Acceptance for mailing at special rate provided for in Section 1103, Act of October 3, 1917; authorized February 4, 1925.

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American Veterinary Medical Association

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(Original Official Organ U. S. Vet. Med. Ass'n.)

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Reprints should be ordered in advance. Prices will be sent upon application.

Vol. LXI, N. S. Vol. 14 May, 1922 No. 2

BE ON WATCH FOR FOOT-AND-MOUTH DISEASE

IT IS reported that since January 1, 1922, foot-and-mouth disease has been discovered in over 1,100 herds in England and Scotland, resulting in the slaughter of more than 50,000 animals, at a cost estimated at $5,000,000. The seriousness of the outbreak is apparent when we recall that only 4,461 and 3,636 animals respectively were slaughtered as a result of the disease during the outbreaks of 1902 and 1908 in the United States.

Although the outbreak in the British Isles has been quite extensive, it seems to be under better control now than at any time since the beginning early in January. The origin of many of the outbreaks in herds has not been determined definitely, but in numerous instances the infection has been traced from farm to farm in the quarantined areas. No doubt the disease reached England in some way from the continent. Many believe that it was brought there by migratory birds, and Sir Stewart Stockman has suggested the possibility that particles of saliva from diseased animals may be carried across the Channel by the wind. The theory that it was carried to England in the clothing of soldiers returning from the continent seems to have few supporters.

The importation of such feeds as hay and straw originating on the continent is prohibited, but some believe that hay and straw used for packing crockery and other imported goods are possible sources of infection. It is said that such refuse as the bottoms of straw and hay stacks, to which animals had free access, is purchased for packing purposes and that when the goods are unpacked this soiled hay or straw is often disposed of to farmers or dairymen, who use it for bedding. Attention is also called to the fact that feathered game and poultry from countries where the disease exists are shipped to different parts of Great Britain for fattening or other purposes, and it is suggested that if infectious material can be carried by migratory birds, it might be carried on the feathers of game and poultry brought into the country.

The Channel Islands,[1] much closer to the infection on the continent, have escaped outbreaks while the disease has raged in England and Scotland. In this connection we understand that the authorities of the Channel Islands are very exacting in applying measures to prevent an invasion of the disease, even requiring that all boxes or crates containing pottery and other goods protected by hay or straw packing be unpacked at the docks on arrival and the packing material burned. They also require that all feathered game and poultry from a country infected with foot-and-mouth disease, upon arrival at any of the ports of the Channel Islands, be plucked and singed and the feathers burned at the pier.

It is understood that a British Departmental Committee is to be appointed for the purpose of investigating the origin of the present outbreak in Great Britain. The authorities, under the direction of Sir Stewart Stockman, have been giving much attention to the study of the origin of the outbreak. The veterinary profession of the United States and Canada will be deeply interested in the report of the committee.

It is believed that our import regulations are as effectual as practicable under existing commercial conditions, and they are being applied rigidly; but notwithstanding the protection afforded by this barrier, there are some sources of danger which are very difficult to guard against. For instance, it seems pos-

[1] Since this was written a report of the appearance of the disease on Sark Island has been received.

sible for the virus of the disease to be carried long distances in the clothing and belongings of immigrant farm laborers, or in hay and straw used as packing for crockery and other imported goods. We may consider ourselves fortunate to have escaped an invasion through these channels, exposed by commercial contact as we have been, especially since the war, to countries that are sources of danger. Therefore, it becomes necessary for the veterinarian and livestock owner to be eternally vigilant to detect promptly the first appearance of the disease, in order that it may be "nipped in the bud." All suspicious cases coming under observation should be immediately reported to the nearest Federal and State offices. Better make a thousand mistakes in reporting negative cases than fail to report one positive case.

Many cattle are now being imported into Mexico from South America owing to the very low prices for which they may be bought, and this opens up an additional possible channel of infection. As foot-and-mouth disease exists extensively in South America, infection is apt to be carried into Mexico. Since there is a possibility of the disease suddenly reaching the United States through infected cattle from South America, or Mexican cattle that have become infected from them, veterinarians and livestock raisers located in the Southwest are cautioned to keep in close touch with the condition and movement of cattle along the Mexican border in order to guard against an invasion of foot-and-mouth disease from that source.

Dr. T. E. Munce, President of the U. S. Live Stock Sanitary Association, has wisely appointed a committee to cooperate with the Bureau of Animal Industry in the protection of our livestock industry from an invasion of the disease, as it was felt that the Bureau should have the benefit of opinions and suggestions from sources outside of the Department of Agriculture. The committee appointed is as follows: E. S. Bayard, Chairman, J. H. McNeil, L. H. Howard, C. J. Marshall, V. A. Moore, A. J. Glover, S. E. Bennett, and H. R. Church.

LIVESTOCK CONDITIONS IN CANADA

THE VALUE of an organized veterinary sanitary body to the livestock interests of a country is well exemplified in the last report of the Veterinary Director General for Canada. This report shows very clearly that difficult problems associated with

the eradication of contagious diseases can be overcome, and success achieved, provided the active and most thorough cooperation of the livestock owner is obtained. It was possible with this cooperation to practically eradicate cattle mange in an area comprising approximately 74,900 square miles consisting of open prairie, scrub lands and cultivated sections, which had been under quarantine restrictions for this disease for a period of many years.

This report also shows that there has been no recurrence of dourine for two years, an epizootic which once threatened disaster to the largest horse-breeding territory in Canada. Glanders is also under complete control, this disease having been found in only three provinces of the Dominion, necessitating the slaughter of 59 horses.

The control of garbage feeders by a licensing system, and a systematic inspection of premises on which this material is fed to hogs, has, in view of the conditions existing in that country, justified the policy of controlling hog cholera without resorting to immunization by the simultaneous method. The prompt detection of this disease and efficient control have reduced the number of outbreaks of hog cholera to very reasonable limits.

The report shows one outbreak of anthrax, eight of sheep scab and ten of rabies. These outbreaks were promptly controlled and eradicated, and involved only a small number of animals.

It is quite evident that the Accredited Herds Plan and the Municipal Tuberculosis Order policies for the control and eradication of bovine tuberculosis are gaining in popularity with the Canadian livestock men. Their demands for assistance in this connection have been so numerous that the Health of Animals Branch have been unable to give all attention, owing to their limited staff and also to the limited amount of money appropriated for this purpose.

It seems unfortunate that after so many years of opposition on the part of the livestock owner to any suggested measures for the eradication of this disease there should be difficulty in obtaining sufficient funds to meet their more recent demands for the control and eradication of not only the most costly disease of all livestock, but also of one that is undoubtedly the greatest menace to the public welfare. G. H.

RUNTY LIVESTOCK—CAUSE AND PREVENTION

AN INQUIRY recently made by the United States Department of Agriculture, on the cause of runty livestock, results in information of considerable interest to veterinarians. Nearly a thousand stockmen and breeders contributed their experiences in response to a questionnaire on the subject. The results are briefly as follows:

Inferior breeding, inadequate or unsuitable feed, and parasites are, in the order named, the three principal causes of runts, according to opinions of 783 stockmen. These causes are believed to be responsible for more than 75 per cent of runty animals. Other causes reported are lack of adequate housing and care, contagious diseases, exposure, accident, inbreeding, breeding immature animals, excessively large litters (swine), poor condition of the dam, and overcrowding at feed.

The most critical period in an animal's life, according to a summary of opinions, is just before and soon after weaning time. More than 85 per cent of runty animals become runty at this stage of growth. It is the time when the dam fails to supply the nourishment needed by a growing animal and when the young animal must learn to eat other feed. Greater care of livestock at weaning time and a study of the animal's feed requirements are desirable at this critical period in development. The proportion of animals which are runty at birth is only 4.4 per cent of the total.

Whether it pays to raise a runt to market size is a question that caused lively discussion. The runts which may be raised profitably, the evidence indicates, are those which are of good breeding. Even though an animal is small at birth it will grow as well as its larger brothers and sisters if given the proper care. Many stockmen told of experiences in developing excellent animals which had been small at birth, or which were only slightly stunted; but it seldom pays to give extra care and feed to a runt of inferior breeding.

There was a general agreement among livestock owners that a better understanding of the runt problem based on publicity and discussion will greatly reduce the proportion of undersized animals. According to the results of the inquiry about 7 per cent of livestock is in the runty class, and financial returns received from livestock of all kinds would be increased about 13 per cent if runts could be eliminated entirely.

Better breeding, especially the wider use of good purebred sires, was an outstanding topic of discussion. A farmer in Pulaski County, Va., where the "Better Sires—Better Stock" campaign has made much progress, writes: "Over 300 farmers in this county have pledged themselves to breed to nothing but purebred sires of any kind and have distributed good bulls over the county. In three years our cattle have improved from 50 to 75 per cent. The same can be said of sheep, hogs, and poultry. Don't breed runts and you won't have them."

Among poultry, runts are due to the same general reasons which cause them among the larger animals, but early hatching is an additional factor. The proportion of runts is very much larger among chicks hatched after the first of June. The reports of poultrymen corroborate the results of Government experiments on this subject.

An observation which makes the foregoing comments of significance to the veterinary profession is the rather subordinate position which disease occupies as a cause of undersized livestock. The results as reported, however, are based on the opinions of stockmen who probably are more familiar with feeding and breeding questions than with animal anatomy and pathology. The opinions of veterinarians on this subject are, therefore, invited. The estimated 7 per cent of runty animals in the total means between 10 and 15 million head of undersized livestock in the country. It is plainly a problem worthy of attention by the veterinary profession.

ANOTHER MISSTATEMENT EXPLODED

ON February 11 the following letter was received from L. A. Schmidt, D. V. M., West Point, Iowa:

Please find inclosed clipping from *Better Farming*, an agricultural paper published by Farm Press Publishing Company, 141 West Ohio St., Chicago, Ill.

Is it possible for a county agent to do testing for tuberculosis when we graduate veterinarians are required to take all state board examinations? It cost me almost $50.00 last June to take the examination for accredited veterinarian. I wish to know whether or not the statement contained in this clipping is true.

The clipping is as follows:

TWO GOOD RECORDS

A total of 972 head of cattle in one locality were tested for tuberculosis in two weeks by County Agent D. B. Morris, Grand Forks, North Dakota. This is some activity and the agent has more than

one thing to do, you know. The cattle tested included 59 herds and only seven reacted showing the disease. This is a remarkable record. The seven head having tuberculosis were killed and the owners will be partially reimbursed for them from State and Federal funds. These tests were made as a part of the purebred sire campaign which is being staged in Grand Forks County by County Agent Morris.

The matter was taken up through Dr. H. H. Cohenour, inspector-in-charge, Bismarck, North Dakota, and in a letter he transmitted, dated February 15, Mr. Morris made the following reply:

Your letter written February 14 at hand, also information contained in a newspaper clipping which the Bureau of Animal Industry at Washington had sent you. I wish that you would advise me as far as possible where the clipping containing this information was secured. I certainly do not know where they got such information, as it never went out from this office. Last November Dr. Alfred M. Brolling (an approved veterinarian) conducted the tests as outlined in the article you inclose and in which I assisted him in lining up the different herds and furnishing transportation. As I remember it, I saw an article in one of the state papers, either the *Fargo Forum* or *Courier News*, which gave a synopsis of the tests as conducted, but the article didn't state that I did the testing as was outlined in the article you inclosed.

If possible I wish you would find out where this article appeared, and I will see that they hear from me and a correction made if possible. I want to give your department full credit for the good work you have done in this county and wish to express appreciation at this time for the cooperation you have given us.

The clipping referred to is an illustration of some of the erroneous statements that have been circulated relative to tuberculin testing being done by county farm bureau agents, with Government approval. It may be definitely stated that Federal funds are not being used for tuberculin testing by county agents, nor for indemnifying owners of reacting cattle, where the tests have been made by other than authorized veterinarians.

POINTS OF INJECTION IN IMMUNIZING SWINE

THOSE who are most familiar with hog cholera treatment are advising their colleagues to avoid injecting serum and virus into the muscles of the ham and shoulder in immunizing swine against cholera. Post-mortem inspection of swine injected at these points sometimes reveals deep-seated abscesses in the ham and shoulder. This results in losses through condemnations of meat, which can be avoided by making the injections at some other place.

The ham is a favorite place for making the injections because

they can be made more rapidly and easily at that point. The number of abscesses found in hams at packing houses indicates that some veterinarians, and many farmers who do their own immunizing, persist in making ham injections notwithstanding the information that has been already published on this subject. Those interested are advised to see to it that hog-cholera serum and virus are not injected into such valuable parts as hams and shoulders. Immunization can be accomplished with equal success when the serum is injected into less valuable parts of the animal.

In administering serum and virus the injections should be made into tissues that will absorb such liquids and at a place that will drain readily in case an abscess should form at the point of injection. Fat does not absorb serum readily; therefore the injections should not be made into masses of fatty tissue. The serous membrane lining the abdominal cavity absorbs liquids readily, but on account of the danger of puncturing the internal organs with the needle, and also the danger of carrying infection into the abdominal cavity, which might result in producing abscesses and peritonitis, abdominal injections as a general practice under present conditions are not recommended.

Probably the most satisfactory results in general field practice are obtained when serum is injected into the loose connective tissue of the axillary space or the flank. In making injections into the axillary space the front legs should be spread apart so as to stretch the superficial muscles between the legs, and the needle should be directed so as to avoid the muscles of the shoulder. Farmers' Bulletin 834, Hog Cholera, states:

> This places the hog in a desirable position for making the injection between the foreleg and the body, which is regarded by many as the best location. Small pigs and shotes up to 75 or 80 pounds may be held up by the hind legs with the forefeet resting on the ground, and the injection made beneath the skin into the loose tissues of the flank. This is the most convenient way of handling a small pig, as it may be held by one man and is in a suitable position for taking the temperatures, cleansing the areas of operation, and making the injections. Injection into the ham should be avoided, particularly in grown hogs that are to be placed on the market before they have time to recover fully from the injection, as abscesses may develop and remain undiscovered until the ham is cooked and cut for use.

OBSERVATIONS OF VETERINARY PRACTICE [1]

By J. V. LACROIX

Editor, The North American Veterinarian, Evanston, Illinois

AS with the practice of medicine, veterinary practice has its origin in empiricism. Without going into historical mention of the work, it is pertinent to remark that all who have been interested in veterinary science for fifteen or twenty-five years have noted many interesting developments in connection with the progress that has been made. This period has marked many notable changes in the nature of the work, due chiefly to discoveries regarding disease causes, prevention and treatment.

With the changes in the nature of veterinary practice there has come, perforce, a different attitude on the part of those engaged in the work, and to this is due the increasingly favorable esteem in which veterinarians and veterinary science are held by the public.

Even with a superficial examination of that which is touched upon in the foregoing, it is well to consider briefly the methods employed for training veterinary students in our schools and the activities of these men in practice after graduation. The change in the nature of veterinary practice and veterinary problems in other fields than that of practice has been so sudden and in some respects so radical that those who direct veterinary colleges and outline the scope of work that must be covered in order to meet demands are coping with problems the magnitude of which few others appreciate.

When, generally speaking, veterinary practice was equine practice, and exceptionally a bovine subject was presented for treatment, the course of training required to fit men for such work was comparatively simple. Then, as it is now, the study of anatomy was the foundation of a veterinary education; the horse was the logical type; students were required to become familiar with that which was in many respects the duty of artisans rather than of scientists. Great stress was placed upon clinical teachings, and the laboratory (exclusive of that for the study of anatomy) received little attention. The more suc-

[1] Presented at the meeting of the Ohio State Veterinary Medical Association, Columbus, Ohio, February 2, 1921.

cessful practitioners were horsemen or those who were sufficiently adept to become passably good horsemen. The examination of individual patients was the rule, and the need for keenly developed faculties for making physical examinations was imperative. Herd diseases were not so frequently dealt with as is the case today, and proficiency in the technic of autopsies was less essential than it is at present.

Those who received training along the lines just mentioned, and who have been in practice since, constitute a goodly portion of the practitioners of the country. The more successful are well established in their respective localities and are serving an appreciative clientele. They have had opportunity to progress with the times, and if they habitually meet and mingle with their confrères at society meetings, participate in postgraduate work in some measure and read veterinary literature regularly, they certainly have no cause to envy the more recently trained veterinarian who launches into practice. As a matter of fact, they have the advantage of a background supplied by years of experience that is invaluable and not to be acquired otherwise.

The veterinarian who has entered the field of practice during the last six or eight years has been regularly trained along all lines necessary to qualify him to cope quite successfully with the variety of problems that present themselves to the practitioner of today. He has advantages that are not possessed by many of those who have been in practice fifteen or twenty years, but owing to the different species of animals to be considered and the variety of diseases that all practitioners must treat now, it is fair to presume that he must lean on laboratory diagnosticians and call in counsel rather frequently or blunder.

During the last decade an influence has made its impression on veterinary practice in a way that is worthy of consideration. It is the purveyor to the veterinary practitioner, his laboratories for diagnostic work and the preparation of agents for use in disease prevention and treatment. This has materially contributed to the progress in veterinary practice that has marked the last decade. While credit is due others for the research work that resulted in the introduction of many of the biologic preparations now in use, we have to thank private enterprise and commercial rivalry for the perfection of these agents.

All of this has afforded opportunities for the practitioner's

success and made his work more interesting in many ways, but it has also put demands upon him that are not to be disregarded. These demands must be met by every practitioner, and the manner in which he comports himself determines the nature of his practice and largely the reputation he acquires. This responsibility resting upon veterinary practitioners imposes its exactions on the competent and the incompetent, the conscientious and the derelict. When a practitioner who is wholly unfamiliar with the anatomy of the porcine subject, untrained in pathology, and none too skillful in the technic of postmortem examinations, unaided, presumes to diagnose some atypical swine disease, he is consciously or unconsciously jeopardizing the interests of his client as much as does the more or less unpracticed youth who refuses to seek assistance in a difficult case of parturition.

Viewing the obligation as a whole, one must take into account the fact that, while the vast majority of us strive to measure up to requirements, there are those who are delinquent. And it is because of these exceptional cases that unfavorable criticism is made, and our profession as a whole must suffer, when it suffers.

Nothing in connection with veterinary practice has afforded as much opportunity for the practitioner to extend the scope of his usefulness and profit as a result than has the use of anti-hog-cholera serum. Hog cholera is a disease that has occasioned so much loss and been the cause of so much worry to such a large number of swine raisers of this country that when an agent for preventing the disease has been perfected, its use approved by science, and its almost infallible specificity widely advertised, veterinary practice is certain to be markedly influenced by this product and its administration. No ambitious practicing veterinarian while conducting his work is blind to opportunity for making legitimate pecuniary gain, and when this may be done in a dignified manner, even the ultra-ethical become interested.

But with the advent of anti-hog-cholera serum, obligations and responsibilities have been saddled upon the practitioner of a nature such as he had never before experienced. With few exceptions, practitioners have conscientiously assumed responsibilities thus imposed and have labored faithfully to equip them-

selves to meet the specific and newly imposed demands. In the performance of their functions in this work practitioners have adopted various methods, and, generally speaking, results have been in keeping with the methods employed.

Veterinary practice that is related to the use of anti-hog-cholera serum is given specific consideration in these observations because of its economic importance to the practitioner and client, and furthermore, because fundamentally this particular kind of practice differs in no wise from other practice as it impresses the client and reflects upon the veterinarian.

Approximately five hundred million cubic centimeters of anti-hog-cholera serum is used in this country every year. Estimating that 50 c.c. is the average quantity given each hog, only about 10,000,000 swine are treated annually. In recent years, according to Federal crop estimates, there were approximately 70,000,000 hogs in the country on January 1 of each year. This would indicate that about 14 per cent of swine are immunized against cholera. According to some whose business it is to give such matters chief consideration, if all the swine of this country were given serum, cholera would not be eliminated; it would simply be made impotent and kill but few hogs one season, only to become more fatal as soon as the use of serum was discontinued.

Like insurance, swine vaccination can not be allowed to lapse. And the use of anti-hog-cholera serum, with all that is related to it, as it concerns the veterinary practitioner, always ought to be considered insurance against loss for the client. The insured pays the premium, the practitioner is agent and director, and the serum may be likened unto the principal of the policy.

In the estimation of many practicing veterinarians, methods employed in swine vaccination and all that is directly related to the work largely determine the attitude of clients. In some communities farmers with propensities for doing their own veterinary work as well as that of their neighbors when possible have agitated the matter of special legislation for providing means for hog owners to do their vaccination without veterinary service. Other agencies have been active in promoting the idea of "farmer vaccination." In one Iowa county 105 farmers recently took the course of instruction given for the administration of anti-hog-cholera serum. This is not representative of all parts

of the State, according to the information received, but is perhaps the largest class to which instruction has been given.

It is not the purpose of these remarks to consider the various aspects of the problem which confronts Iowa practitioners, but in passing it may be said that while swine vaccination by laymen can not prove practicable in the long run, and comparatively few farmers will find it satisfactory to continue the work after they start, it is certain to encourage quackery.

Careful investigation of the subject in several of the Corn Belt States reveals the fact that where dissatisfaction occasions any considerable trouble for many, it is due to excessive charges made by those who purchase serum for the lowest possible price and collect for their services by rendering a bill for serum used at a price that is known to be unfair and unreasonable. It is thought that the activities of such practitioners, with the charges made by their clients, when exhibited before the Iowa legislators and supported by indisputable evidence, were largely responsible for the enactment of the law which provides for giving license to laymen to administer anti-hog-cholera serum in that State. It is not intended in making this statement to convey the impression that nothing else of an undesirable nature enters in causing dissatisfaction. Also we must consider the fact that there are some very able and successful practitioners who base their charges for service rendered for swine vaccination upon the quantity of serum employed, making additional charge only when few animals are treated or where comparatively great distances are travelled especially to do the work.

However, it does not follow that because a veterinarian who is well established as a practitioner, who has earned the confidence of a large clientele, may collect for service rendered for swine vaccination by charging a profit on serum administered, this method is calculated to prove practical in the hands of the average practitioner. It is necessary that the veterinarian charge his clients for the serum he administers, and he must allow himself a margin for handling the serum; but the service he renders really constitutes that for which he makes a charge; otherwise he is apt to be considered a middleman or a merchandizer, and that role may be played by any layman. Any intelligent layman is capable of discharging the contents of a hypodermic syringe into the tissues of an animal when the subject

is properly confined, and when serum administration becomes largely a contest against time, where charges are based largely upon quantity employed, it is no wonder that fault is to be found by those who pay the bills.

Such methods are deplored by every conscientious practitioner, and unless the dissatisfied and disgruntled clients are given encouragement by "pirate" serum dealers and ill-advised county agents, the good influence lent by those who constitute veterinary organizations such as this will forestall any legislation that hampers the practitioner in the discharge of his duties.

ACCURATE THERMOMETERS DEMANDED

Of 22,000 thermometers tested during 1921 by the Bureau of Standards, 95 per cent were tested for practicing veterinarians, the remaining 5 per cent being for other doctors (human use). The proportion was especially striking in one State last year where 2,000 thermometers were tested for veterinarians as compared with 12 for doctors.

This brings out the noticeable desire of the veterinary profession for accurate instruments. Of course, veterinarians no doubt break a great many more thermometers than other doctors do and probably the great quantity of tuberculin testing is responsible for the large number of thermometers tested for veterinary use. Notwithstanding these qualifications the figures are rather interesting.

A referendum on the use of alcohol in medical practice, recently conducted by the American Medical Association, indicates that the physicians of the United States are about equally divided on the question of prescribing whiskey. Replies to questionnaires were received from 31,115 physicians. To the question, "Do you regard whiskey as a necessary therapeutic agent in the practice of medicine?" 51 per cent answered yes and 49 per cent no. The vote on beer was 74 per cent negative, and on wine 68 per cent negative. Sentiment in favor of the medicinal use of alcoholic liquors was stronger in the cities than in rural districts.

BOVINE INFECTIOUS ABORTION [1]

By M. F. BARNES

Pennsylvania Bureau of Animal Industry, Harrisburg, Pa.

CONSIDERABLE WRITING was done relative to abortion of cattle during the first part of the nineteenth century, and it was recognized at that time that its cause was transmissible from one animal to another. It was not until almost a century later that its cause was discovered and the opinion by many that it was due to witchery, evil spirits, climatic conditions, fright, smells, etc., was abolished.

The widespread occurrence of bovine infectious abortion, its spread in a country and from one country to another, has been synchronous with the improvement of purebred breeds of cattle due to the movement of cattle for breeding purposes from one part of a country to another and from one country to another.

Not much more than a decade ago there had not been developed any reliable methods whereby it could be determined what animals were infected with *Bacterium abortus* Bang, but in recent years reliable tests have been developed and by their application the spread of abortion disease through the introduction of infected animals should be controlled.

The presence of abortion disease in a herd under usual conditions is not shown until its most characteristic symptom, namely, an abortion, has occurred. The losses encountered can be best related by those who have experienced a scourge of its ravages.

The number of abortions in cattle due to organisms other than *Bacterium abortus* Bang is believed to be less than 1 per cent. This belief is based on data collected from a large number of herds which were negative to tests for bovine infectious abortion, also to some extent from herds infected with the latter disease. However, there are other exceptional or unusual conditions and acute diseases which may cause contraction of the uterus and expulsion of the fetus.

PENNSYLVANIA'S BOVINE ABORTION POLICY

The history of abortion and attempts to remedy it in Pennsylvania are probably just as complete as those of any other State

[1] Presented at the thirty-ninth annual convention of the Pennsylvania Veterinary Medical Association, Harrisburg, Pa., January 25, 1922.

or any nation. Bovine abortion was recognized as epizootic in nature because the cause was discovered. Hudecoper in 1895 divided abortion of cattle into contagious and sporadic. He appreciated that the number of abortions which did not belong to the transmissible class was small. Since 1896, when Prof. Bang discovered the cause of transmissible bovine abortion, Pearson, Gilliland, Klein, C. J. Marshall and Munce have had to do with Pennsylvania's bovine abortion policy.

Soon after 1896 Pearson formulated a plan for the suppression of that disease which consisted principally of isolation, sanitation and disinfection. The plan was almost as complete as what we can recommend today. Most attention was given to the treatment of animals after they had aborted, and many things which are known at the present time concerning the nature of the disease were not known at that time. In conclusion with other measures the carbolic acid method of treatment of pregnant cows was given a thorough trial, and in many instances the results obtained were apparently in its favor, more so than any of the present-day published results of the use of vaccine will show; but it finally developed that the carbolic treatment was of no value.

During the period from 1896 to 1911 it was believed, on the basis of the number of reports of the presence of the disease, that abortion in Pennsylvania was becoming less prevalent each year. During that period it was thought that sanitary measures were effectual.

In 1911, during Marshall's occupancy of the chair of State Veterinarian, a more extensive study was commenced. It was learned that the disease was more prevalent than had been previously supposed. An attempt was made to find better diagnostic measures, and during the same year Meyer established the complement-fixation and agglutination tests as a part of our laboratory routine for the diagnosis of this disease. He also made an extended study of the cause and was probably the first in Pennsylvania to demonstrate *Bacterium abortus* Bang as the widespread cause of bovine abortion in this State.

In 1912 Meyer prepared abortin and it was used on several herds to determine its value as a diagnostic agent. Its use was attended with more labor, more disturbance of the animal, it did

not seem to be as accurate as the blood tests, and its use was discontinued after an extended experimental study of its value.

In 1913-1914 methylene blue was given a thorough trial and was shown to be of no value as a preventive.

About this time it was becoming noticed that the losses due to sterility in abortion-infected herds were quite large, and in 1916 the Albrechtsen uterine douche treatment was begun by Ridge as a part of the Bureau's field investigational work, with the object of determining its value in the prevention of sterility and if it would lessen to any extent the number of abortions. Other methods of treating genital defects were used in conjunction with it. The Bureau then gave demonstrations to veterinarians of the method of employing this treatment, and at the present time demonstrates to only those veterinarians who ask for a demonstration.

About two years ago the Bureau started a more concentrated study of this disease with the hope of developing a concrete and practical method for its control.

In May, 1920, work was begun with a mixture of strains of *B. abortus* Bang of bovine origin, to determine the value of vaccination of nonpregnant animals at least 60 days prior to breeding, with a saline emulsion of a living culture of these mixed strains administered in large dosage.

The Pennsylvania Bureal of Animal Industry ever since its organization has constantly studied this disease, always with the hope that suitable methods of control would be devised. Had stockmen been made to realize the importance of precaution the efforts of the Bureau and other organizations working for a similar purpose would undoubtedly within the past twenty years have solved the abortion question. The task would not have been easy, for nothing worth while is easy. It is not too late now to begin a sane policy.

The nature of bovine infectious abortion is such that to prevent its occurrence requires most constant and diligent perseverence. It is not like anthrax, blackleg, etc., occurring only in certain seasons. Pregnant animals are said to be the most susceptible, and in most working herds this class of animals is always present, therefore in infected herds where cows are calving during every season of the year infection is always present. Where heifers are arriving at the breeding age and in herds where new

animals are constantly being purchased, susceptible animals are always present, thus the infection is kept alive.

The members of this Association are sufficiently familiar with the nature of abortion and its symptoms that it is unnecessary to discuss those features at this time.

The study of methods for the control of bovine infectious abortion has been an eliminative study, and before we get on a sane and sound basis it seems it will be necessary to do more eliminating.

There never has been found any successful method for the treatment of this disease. It is believed, on the basis of what has been learned by the numerous investigators of recent years, and on the basis of what practical experience and the practical application of certain principles have taught us, that the disease can be successfully prevented and controlled, and therefore it is suggested that veterinarians recommend the following principles to stockmen:

RECOMMENDATIONS FOR THE PREVENTION AND CONTROL OF BOVINE INFECTIOUS ABORTION

1. Breed and raise your own animals.

2. Make improvements in bloodlines as much as possible by careful selection from within the herd rather than from outside sources, thus excluding outside infection.

3. Every cow in every herd should be handled with as much precaution as though she were known to be infected.

4. There should be provided on every farm a separate stall or stable known as a maternity barn, for cows at calving time. This stable should be so constructed that it can be easily disinfected, or better, fumigated with formaldehyde. On farms containing a large number of cows it should have a sufficient number of completely separated stalls to accommodate the number of cows that would be calving at one time.

5. Every cow should be removed from the herd at calving time and placed in the maternity stable.

6. Every cow showing symptoms of abortion should be placed in the maternity stable.

7. Every cow placed in the maternity stable should be kept there until all discharge has ceased and the uterus has been properly treated and has been determined clean by examination.

8. All afterbirths and aborted or dead calves should be well buried or burned immediately.

9. The maternity stall should be well cleaned and effectively disinfected, or preferably fumigated, before another cow goes into it. The manure and litter should not be placed in the exercise or feed yards.

10. Each pregnant cow, in either pasture or stable, should be seen by the herdsman every day. Any showing symptoms of abortion or nearing normal calving time should be removed to the maternity barn.

11. If purchases are to be made the history of the herd from which one wishes to purchase and the individual animal history should be determined, and if either is doubtful the purchase should not be made until the animal's health is definitely determined, and even then it is safer to purchase from healthy herds.

12. All newly purchased animals should be isolated for a period. All known reliable tests for the determination of their health should be applied.

13. Bulls and unbred heifers are said to be the safest animals to buy, but these should be isolated for a period, and should have passed the blood test for bovine infectious abortion before they are incorporated into the main herd.

14. Pregnant animals should not be purchased unless they are isolated until they have given birth to a normal calf, have passed a satisfactory blood test not within two weeks after having given birth to the normal calf, the uterus has been properly treated and has been determined clean by examination.

15. Any cows that have ever left the farm should be returned only under the same conditions as newly purchased animals.

16 Herd bulls should not be used for service to neighbors' cows.

17. In case an abortion has occurred in the stable the cow should immediately be isolated, the fetus and membranes buried or burned, and the stable well cleaned and disinfected. An abortion occurring in the pasture field should be handled in the same way. The earth at the point should be covered with three or four inches of lime or a strong disinfectant or both.

18. Consider every case of abortion infectious until otherwise determined.

19. See that the herd is given good, clean feed and water.

20. Feed should be obtained from such sources and should be so stored that it will be insured against contamination with disease-producing organisms.

21. Do not allow calves to tramp over feed for the cows. Suckling calves from infected mothers are considered spreaders of bovine infectious abortion.

22. Do not feed unsterilized milk from herds where abortion exists or from creameries to cows or sows. Sows are susceptible to infection with *Bacterium abortus* Bang.

23. Manure piles should not be in the exercise or feed yards.

24. No cow should have access to manure piles at any time.

25. Members of bull clubs should exercise extreme precautions as pertains to abortion and other transmissible diseases. Bull clubs should be considered as consisting of units and handled as one herd.

26. Do not permit any person to inject a vaccine or serum to prevent abortion unless it has been generally recognized of value and has been approved by the State official charged with the prevention, control and eradication of transmissible animal diseases.

27. A living culture anti-bovine infectious abortion vaccine, administered in large dosage, is believed by some to be of some value in the immediate infected herd, but its merits have not been sufficiently proved to recommend its use in other than very badly infected herds, and even then it is doubtful if its merits are sufficient to rank it higher than the above precautions properly executed. It has been proved that it does not do damage. It should be used only experimentally under official supervision.

THE BLOOD TEST FOR BACTERIUM ABORTUS BANG INFECTION

The blood test for bovine infectious abortion has been so perfected that when properly applied we believe it is nearly 100 per cent accurate in picking out infected animals.

The two tests most commonly used are the agglutination and the complement-fixation. One seems to be just as accurate as the other. A reaction to either or both tests does not indicate that an animal has aborted or that it will abort. It does indicate infection with *Bacterium abortus* Bang. Neither test may pick out recently infected animals. It would, therefore, be nec-

essary to repeat the test in thirty to sixty days to find animals in which the disease was in the incubative stage at the time of the first test.

The test is of practical value for establishing a diagnosis of infection in a herd; for determining the extent of infection in that herd; for testing animals to be added to clean herds; and where facilities exist, for dividing a herd into a reacting and a clean herd.

The summary given below of the percentage of reactors among the different classes of bovine animals according to age and sex represents the results of tests on sera collected from animals in extensively infected herds. Infection with *B. abortus* Bang had been present in these herds for periods ranging from six months to approximately fifteen years, with an average existence of infection for approximately four years.

Results of Blood Tests in Badly Infected Herds

Four hundred and twenty mature females in 9 herds showed 223 reactors, or 53 per cent.

Eighty-two unbred heifers over 1 year of age in 7 herds showed 11 reactors, or 13.4 per cent.

Twenty-six females between 6 months and 1 year of age in 5 herds showed 5 reactors, or 19 per cent.

Twenty females under 6 months of age in 5 herds showed 4 reactors, or 20 per cent.

Sixteen mature bulls in 6 herds showed 6 reactors, or 37.5 per cent.

Eleven males under 6 months of age in 5 herds showed 3 reactors, or 25 per cent.

THE HERD BULL

The part played by the bull in the spread of bovine infectious abortion from one animal to another is not clearly understood. His relation to the spread of this disease probably depends to a large extent upon whether he is infected or not.

INFECTED BULLS

Experiments conducted by Schroeder would seem to indicate that the bull, whether infected or not infected, does not play much of a part in the transmission of abortion. However, similar experiments should be conducted on a large scale including a large number of infected bulls. If infection in cows can not be produced by the introduction of the abortion organisms through the vagina, as Schroeder's experiments seem to indicate, then cows served on neutral ground to infected bulls would not become infected.

Bulls' semen containing *B. abortus* Bang should be considered just as dangerous as any other material containing that organism, and if cows can become infected only through the mouth as a channel, the pasture, feed and water contaminated with semen from reacting bulls, as well as when contaminated with the organism derived from other sources, should be kept from the mouths of cattle. Reacting bulls should not be pastured with nonreacting cows. Cows which have been served by reacting bulls should not be placed in free contact with nonreacting cattle for considerable time after service. Material containing the organism which has dribbled from the vagina to the ground could be taken into the mouth by the same cow from which it dropped or by other cows.

Bulls may be more susceptible to infection than we have formerly believed. Just what conditions are necessary for bulls to become infected, the channel of infection, and what percentage of them discharge *B. abortus* with the semen have not been conclusively determined.

While cows usually become infected through ingestion of *B. abortus*, it has not been proved that there are not certain percentages which become infected through the vagina and through the teat canal.

If infected bulls are a factor in the spread of bovine infectious abortion and it is through the presence of the organism in their semen that they become a factor, then to douche their sheaths either before or after service would be of no avail in prevention of the spread of the disease.

NONINFECTED BULLS

Nonreacting bulls which are allowed to serve only nonreacting cows can do no harm. Nonreacting bulls which are permitted to serve reacting cows only after the genital tract of the latter are clean and free from discharge should not transmit the disease when used on healthy cows. Since *B. abortus* can seldom be found in the genital tract of cows for more than from thirty to sixty days after calving, the practice of serving cows after that time should be safe so far as transmission of infectious abortion by the bull is concerned. Some good breeders have stated that cows which have aborted should not be served until after the time the calf would have been born had it been carried

to maturity. Others want the cow to conceive again as soon as possible after the occurrence of an abortion. The Pennsylvania Bureau of Animal Industry has always advised that cows be held for considerable time after an abortion before being served. Pearson, in his outline for the control of abortion stated that ten weeks was the proper length of time. If the genital tract is in the proper condition when a cow is served there should be no necessity for douching the sheath of the bull. If the genital tract of the cow is not in the proper condition and contains *B. abortus* Bang, to douche the sheath of the bull after being used for service may prevent him from becoming infected.

ANTI-BOVINE INFECTIOUS ABORTION VACCINATION

It was stated above that the Pennsylvania Bureau of Animal Industry had begun the use of a living-culture vaccine in May, 1920. Since the beginning of this work there has been a total of between 275 and 300 heifers and mature cows vaccinated at least sixty days prior to breeding, in a total of ten badly infected herds situated in several sections of the State. There has been a total of approximately 250 to 275 heifers and cows left as controls. The work has not progressed to the point that a final report can be rendered at this time. The vaccine is kept at refrigerator temperature and has been used at different ages, ranging from a freshly prepared saline emulsion of *B. abortus* (several strains) to an emulsion three to four months of age. It is tested culturally to determine that the organisms are alive before being used for vaccination. The dose has usually been between 600,000,000,000 and 1,000,000,000,000 organisms, although this dosage has been considerably decreased for some cows and considerably increased for others.

The following results are not intended as a final report of this work, nor as a final report of the herd from which they were obtained, because there are considerable data pertaining to them which have not been summarized.

HERD NO. 1

Twenty unbred heifers separated from the main herd were blood tested for bovine infectious abortion with the result that all were negative. Ten of these heifers were vaccinated with a freshly prepared living-culture vaccine, placed in the main herd,

and bred in from 6 to 120 days. One of these was sold and the breeding record could not be obtained. Another has not conceived. This leaves a balance of eight vaccinated heifers. Three of the eight aborted, and five calved at full time.

Five of the twenty heifers were placed in the main (infected) herd as controls and were bred in from 40 to 120 days. One of the five has not conceived, which leaves only four, all of which calved normally.

The remaining five of the twenty were kept separated from the infected herd. All five conceived and calved normally.

The main herd had been infected for seven to eight years. During the period of this experiment there were approximately fifty conceptions in the herd, including those of the fifteen heifers. There were eleven or twelve abortions.

Main Herd Including Added Heifers

Number conceived	50
Number abortions	12
Per cent abortions (approximate)	25
Per cent normal births (approximate)	75

Heifers Vaccinated and Exposed

Number conceived	8
Number abortions	3
Per cent abortions	37.5
Per cent normal births	62.5

Heifers Exposed as Controls

Number conceived	4
Number abortions	0
Per cent abortions	0
Per cent normal births	100

HERD NO. 3

The herd consists of 70 to 75 females of breeding age and has been infected for five years. The entire herd was blood tested.

Six unbred heifers and one three-months pregnant heifer were vaccinated with a freshly prepared living-culture vaccine. It was not remembered by the herdsman at the time that the pregnant heifer had been bred. She was negative to the blood test at the time of vaccination and carried her calf to maturity. This leaves a balance of only six heifers, the results of which are as follows: Heifer 6-He was positive to the blood test before vaccination and the other five were negative.

No. 1-V. Conceived 67 days after vaccination. Aborted at 4 months.

No. 2-Ho. Conceived 114 days after vaccination. Aborted at 6 months.
No. 3-L. Bred 150 days after vaccination and afterwards showed no signs of estrum. Thought to be pregnant until determined that she was not. This is unusual for heifers the age of this one. She may have aborted in the pasture unnoticed.
No. 4-MG. Conceived 150 days after vaccination. Calved normally.
No. 5-D. Conceived 109 days after vaccination. Calved normal time. Calf died.
No. 6-He. Conceived 103 days after vaccination. Calved normally.
6 minus 1 (3-L) equals 5.
Two of the 5 aborted equals 40 per cent.

Data pertaining to the entire herd have not been summarized, but it is known that the number of abortions during the period of this experiment was small—less than 10 per cent. More than 40 per cent of the cattle of breeding age reacted to the blood test.

CONCLUSIONS

Abortion disease for a long time has been recognized as a transmissible disease of cattle.

Its widespread occurrence has been synchronous with improvement of purebred breeds of cattle.

Accurate methods for determining if animals are infected with *Bacterium abortus* Bang are of comparatively recent development.

It is usually not recognized clinically until an abortion has occurred, and therefore often not until considerable damage has been done.

The amount of loss caused would be difficult to estimate.

The number of abortions of cattle due to causes other than *B. abortus* Bang is comparatively small.

It has been as extensively studied in Pennsylvania as elsewhere.

Breeders as a rule have not been sufficiently concerned in its prevention.

Its nature is such that the usual method of herd management would tend to keep active instead of eliminate its cause.

To install effectual prevention and control measures universally, it will be necessary, first, to eliminate supposed remedies and propaganda pertaining thereto.

The practical application of certain principles indicates that abortion can be prevented and controlled.

The blood tests properly applied are practical and dependable.

The part played by the bull in the transmission of *B. abortus* is not thoroughly understood and should be considerably studied.

Anti-bovine infectious abortion living-culture vaccines are still in the experimental stage and may do more harm than good. Their distribution should be regulated by law.

The writer is indebted to Dr. E. L. Stubbs for conducting laboratory work on blood tests, and to the several veterinarians and stockmen who have made possible and supported our work. Continued interest and support are solicited, with the expectation that the work of the Bureau on this disease will be of universal benefit to stockmen of the future.

JUBILEE OF PROFESSOR PERRONCITO

The Second Congress of Comparative Pathology will be opened at Rome, in September, 1922, presided over by one of our honorary members, Prof. Dr. Edward Perroncito, whose Jubilee will also be celebrated at Turin about the same time, since the Doctor is about to retire from teaching at the University, because of age limit.

The Directing Council of the International Museum of Apiculture and Silkworm Culture of Turin, in honor of its founder and president, Professor Perroncito, to whom is due the discovery of the disease suffered by the miners of St. Gothard, has addressed the many friends of the illustrious Professor, in order that their united efforts may make it possible to put into execution the project to establish new quarters for the Museum to bear the name of its founder—"Perroncito Museum."

The proposal to make the study of the English language compulsory in the preparatory schools of Germany calls forth this expression from the *Münchener Medizinische Wochenschrift:* "Since scientific research in the United States has made such advances, thanks to the wealth of the country, and American literature is on the point of taking the lead in medicine, a knowledge of English has become indispensable for the research worker." Hitherto the study of English in the German schools has been optional, while French has been compulsory.

A STUDY OF SO-CALLED KENNEL LAMENESS: PRELIMINARY REPORT[1]

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FOR SEVERAL YEARS one of us (Brimhall) has observed a condition which occurs spontaneously in dogs and for want of a better name and an opportunity to make a complete study of its occurrence, etiology, and pathology has been named "rheumatism" or "kennel lameness." The earlier observations with other more recent data are presented here. Besides several characteristics common to these diseases, there is softening and deforming of certain bone structures approximating a condition of osteomalacia but with several differences. For this reason we have chosen to describe the disease under an indefinite name until the completion of studies which may permit an accurate definition.

The condition was noticed first in the winter of 1916-1917. It is apparently common to a certain percentage of dogs under observation in kennels for periods ranging from several weeks to several months and in a few cases for one or more years. It is characterized by a gradually increasing stiffness in gait, and if allowed to progress it results in marked softening and deformity of bone, which is limited to the ribs, scapula, pelvis and vertebræ. In the beginning, affected dogs show a slight stiffness in moving about, which does not disappear with exercise, and they may or may not evince pain by flinching, whining or yelping when moving quickly or when picked up or otherwise handled. The stiffness gradually becomes more marked; there is loss of weight in spite of unimpaired appetite; muscle atrophy develops, and after several weeks or months the skeletal deformities appear. Of the latter, those to be observed ante mortem are confined to the ribs, which show multiple nodule formation and may bulge either in or out, resulting in considerable distortion of the chest wall. In some cases a depression runs transversely or diagonally to the long axis of the ribs in which two or three fingers might be laid. The back is usually

[1] Presented before the twenty-fifth annual meeting of the Minnesota State Veterinary Medical Association, St. Paul, January, 1922.

arched, excessively in some cases, and the abdomen has a tense, "tucked-up" appearance. The animals are disinclined to move about, the hair coat is rough and lusterless, and in a number of advanced cases in male dogs the penis protrudes and becomes dry and somewhat shrunken from constant exposure. Occasionally a purulent conjunctivitis or ulcerative keratitis is present; these complications, however, yield to treatment or heal spontaneously, and their course has been found to be quite independent of the major condition except so far as the debilitated condition of the animal favors their onset.

GROSS PATHOLOGY

The most striking features of the disease are seen at necropsy. In old cases the ribs, scapula, pelvis, and vertebræ are softened so that they can be cut with a knife quite easily. The ribs are bent and twisted, with single or multiple nodule formations throughout their length. In mild or early cases which come to necropsy only an occasional rib may show this characteristic formation of nodules, but in severe or long-standing cases practically every rib has from one to three nodules as though the bone had been fractured and repair had taken place (fig. 1).

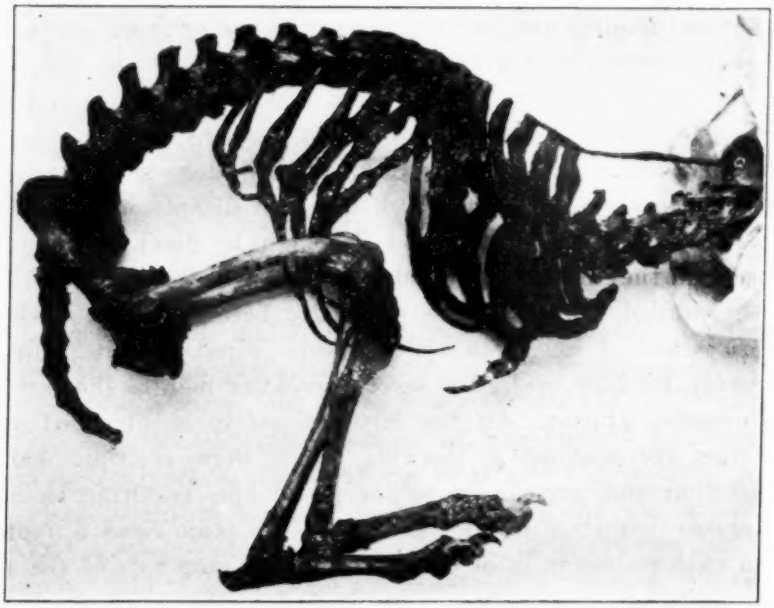

Fig. 1.—Typical rib nodules and thickening of the spinous processes of the first four thoracic vertebræ. The shaft of the right ilium also shows the rough callus.

However, actual fracture has not been observed ante mortem or at necropsy. The nodules involve the entire thickness of the ribs and may be located near the vertebral articulation, near the costochondral juncture, or between these points; rarely, if ever, are the articulations themselves involved as in rickets. The scapula cuts readily, and if dissected free of muscle tissue and allowed to dry it shows further evidence of softening by bending and otherwise failing to retain its shape. The pelvic bones show a constant lesion in that the shafts of both iliums, sometimes only one, are thickened and rough, giving the impression of fracture with callus (fig. 2). Here again we have not ob-

Fig. 2.—Normal pelvis (left) and diseased pelvis (right). The shafts of the iliums show marked differences.

served positive evidence of fracture, either ante mortem or at necropsy. However, in ribs and pelvis the possibility of partial fractures which may have stimulated the processes is admitted. In fact, roentgen-ray examination of some affected dogs demonstrated that a condition approximating fracture may be present in some cases. The vertebræ are markedly soft in old cases, but

only rarely are there other gross changes. The comparative ease with which even the bodies of these normally very hard bones are cut through will probably impress those who have occasion to remove spinal cords at necropsy. Rarely we have seen a callus-like thickening on the ventral surface of a few vertebræ, a thickening of some of the spinous processes (fig. 1), and in a few cases in which the spinal column showed marked kyphosis we found two adjacent vertebræ impacted and partially ankylosed.

Softening or deformity of the long bones of the legs, or bulging or other deformity of the cranial bones, has not been observed. In a very few cases we have detected a thinning of the cortical compact bone substance of the femur, and in one case, while dissecting out the femur, the anatomic head of this bone fractured completely without unusual traction. Otherwise neither the epiphyses of the long bones nor their articular surfaces have been involved.

Grossly, the marrow of affected bones falls into one of two groups. In the first the marrow is deep wine-red or light purple, highly vascular and full of fluid; in the second group the marrow is quite pale, apparently less vascular than normal, and rather dry. In cutting through a rib nodule or through the callus on a pelvic bone the same groups are evident with still another one in which the entire surface of the bone appears white, bloodless, of uniform texture and devoid of marrow space.

Microscopically, the appearance of the marrows agrees with what is seen grossly. As the plates show, there is a marked decrease in the compact bone substance of the cortex and trabeculæ of the ribs (figs. 3 and 4). A complete report of the histopathology of affected bones cannot be given at this time, inasmuch as this phase is still being studied. It is certain, however, that the cellular elements of the diseased bone marrows will show some striking differences compared with the normal.

ETIOLOGIC FACTORS

The etiology of this disease offers considerable ground for speculation, and controlled experiments are at present under way which, it is hoped, will throw light on the matter. It should be emphasized, however, that this condition occurs almost

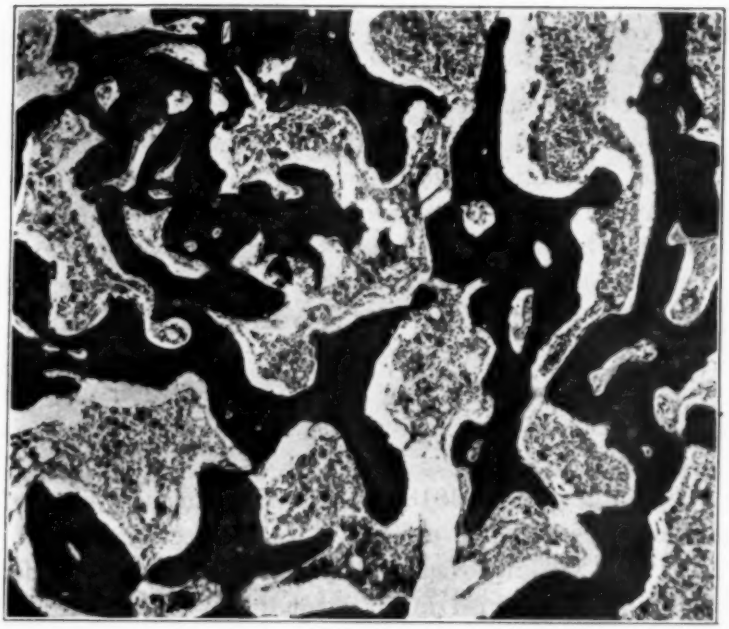

Fig. 3.—Marrow of normal rib. Note the amount of compact bone substance in the trabeculæ and compare with figure 4. (X 50.)

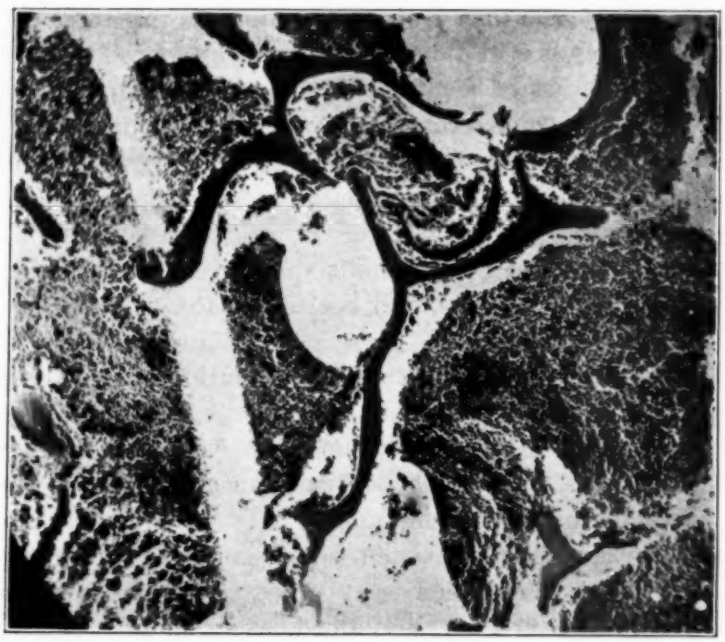

Fig. 4.—Marrow of diseased rib. The compact bone substance is present in about one-tenth the amount shown in the normal. (X 50.)

without exception in mature dogs and should not be confused with rickets.

When the bone changes were noted several years ago they were not associated at first with the condition designated as rheumatism or kennel lameness, which was present in some of the dogs at that time. The lesions were first noticed in a series of dogs that had been subjected to considerable roentgen-ray treatment, and it was thought that the excessive application might be responsible. For some months afterward, a like condition was not observed, although the average number of dogs with rheumatism was noted. Drug treatment for the condition met with indifferent success, although isolated cases showed marked improvement.

In the winter of 1917-1918 animals with lameness were given large quantities of horse meat, besides the regular diet of dog biscuit. They all improved greatly and the majority recovered completely and remained in good condition while under observation, from one to two years. During this period bone changes were found in dogs with rheumatism and the two conditions were definitely associated. The possible etiologic relationship of a deficient diet was then recognized, although the exact nature of the deficiency is still somewhat obscure.

The routine diet of kenneled dogs has consisted, for several years, of dog biscuits broken up and fed in hoppers, so that in many cases the dogs always have food before them. In addition whole milk or buttermilk has been fed to dogs whose condition seemed to require it. For several years horse meat has been fed in considerable amounts during the winter months, but only as an adjunct to, and not to replace, the regular diet of biscuits.

At least three possibilities must be considered with regard to the relationship of the diet to a nutritional disturbance resulting in the so-called kennel lameness. First, a deficiency of lime in the food, or a metabolic disturbance which either interferes with the proper assimilation of lime or favors the resorption of lime salts from the bone tissues, with a resultant osteomalacia; second, a vitamin deficiency which may be responsible for the metabolic disturbance, and third, bacterial invasion.

Hutyra and Marek assert that osteomalacia in dogs is seen only in exceptional cases, while Muller and Glass question the

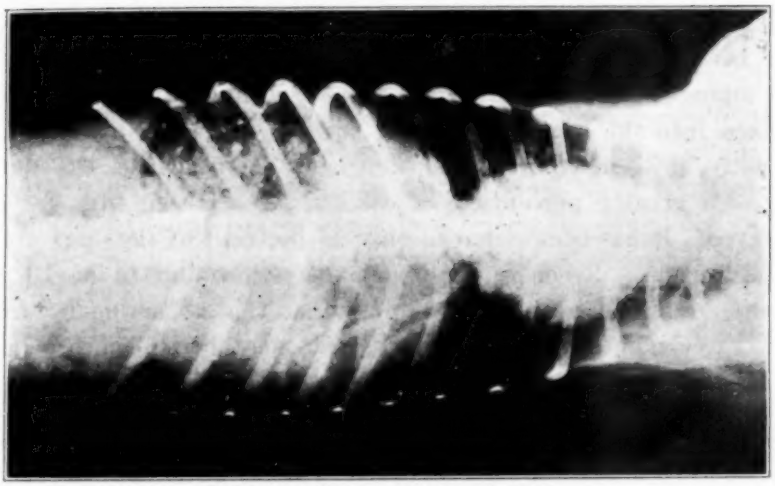

Fig. 5.—Thorax of normal dog.

occurrence of true osteomalacia in these animals. However, the symptoms and pathology of this kennel lameness point essentially to osteomalacia within the general meaning of that term. Since in the latter disease a lime deficiency has always been considered a prime factor, we are at a loss to associate certain phases of the kennel lameness with an actual poverty of lime in the food. The drinking water to which the dogs always have access is very hard and consequently rich in calcium salts. Furthermore, we have recently had a typical case of the disease come to necropsy in which the dog, during the course of an-

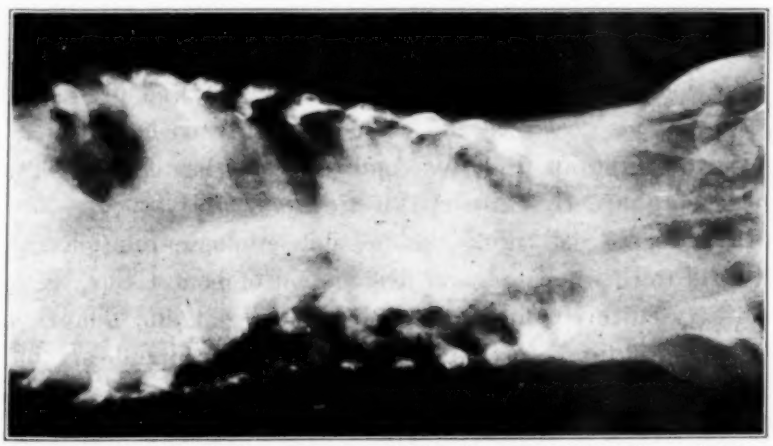

Fig. 6.—Thorax of diseased dog. Note the poor delineation of the ribs (due to lack of salts?) compared with the normal. The nodules and the bent and twisted appearance characteristic of the condition described are shown.

other experiment, had been receiving calcium salts far in excess of his bodily needs. In this case, however, as well as with the drinking water, we have no definite assurance that the calcium taken into the organism is in a suitable state for assimilation. Lastly, it seems that if lime deficiency is the cause, we should have a greater percentage of cases than has been thus far observed. It has been noted in only 15 per cent of the dogs under observation. Recently the incidence was found to be 10 per cent, and it is interesting to note that this reduction occurred in three months during which horse meat had been fed quite regularly with the regular diet.

Steenbock and his co-workers, in reporting an ophthalmic disease seen in dogs that had been fed a diet deficient in fat-soluble vitamin, mention the simultaneous development of skeletal deformities, pronounced in one case, in spite of the fact that the daily ration for each animal contained 5 gm. of precipitated calcium phosphate. This suggests the possibility that they may be observing a manifestation of osteomalacia similar to that seen by us, and modified simply by the age of the animals. Their cases were in puppies, whereas our cases were seen almost exclusively in mature dogs. As pointed out by Friedberger and Fröhner, rickets is merely an osteomalacia modified by the condition of growth in younger bones; osteomalacia is distinguished by a resoftening of the bones of mature animals, while in rickets the bones of young animals remain soft. As we have mentioned, the ophthalmia seen by Steenbock and his co-workers is occasionally seen in our animals, but we believe it to be independent of the condition causing bone changes except as a predisposing factor. It also occurs quite often in well-nourished dogs. We believe it to be an infective condition, and bacteriologic examinations apparently support this view.

In order to determine the possible etiologic relationship of bacteria to the lameness and destruction of bone tissue, we have routinely cultured the marrow of affected ribs and femurs, also the spinal fluid before and after death, and the heart blood. In two rib cultures a pure strain of *Streptococcus hemolyticus* was isolated, and in another case a similar organism was obtained from the marrow of the femur. However, the occurrence of organisms has been very inconstant, and those found have failed

to produce lesions when injected into dogs and other experimental animals.

Discussion

It should be noted in connection with the occurrence of this so-called kennel lameness that the dogs are housed in clean, warm, well-lighted kennels, the sun on clear days penetrating to much of the interior at some time during the day. The cages in which individual dogs are kept are especially accessible to the sun's rays and are constructed so that they remain dry. It is possible that some of our cases of incipient lameness are muscular rheumatism purely, but such cases do not go on to an advanced stage without showing typical lesions of the disease we have described. It would seem, therefore, that rheumatism as such can be omitted from consideration except so far as it is a descriptive term applicable to certain clinical signs of the major disease. The differences between this kennel lameness and osteomalacia are: (1) The bones are more often pliable than brittle; (2) the skull bones do not bulge and the maxillæ are unchanged; (3) the long bones do not show changes grossly except occasionally by a slight thinning of the cortex; and (4) no inflammatory or ulcerative conditions of the joints or articular surfaces of the bones are apparent. Further, it would seem that the incidence of the disease is rather low for true osteomalacia, which should not be limited by the factor of an apparent individual susceptibility. When animals are all subject to the same conditions, such as those under our observation, they may not show signs of the disease from one to more than three years. It has been observed that except in the very early stages fairly large quantities of meat must be fed for a considerable time in order to effect a cure. It is apparent, then, that whatever of value may be contained in meat is present in small quantities and the feeding of it alone would not constitute a practical solution of the treatment. However, it is of value in all cases, and we wish to emphasize the proposition that the dog is primarily a carnivorous animal and that meat, judiciously fed, is not harmful and is an essential part of his diet.

Summary

1. A disease is described which occurs spontaneously in dogs and clinically and pathologically more closely resembles osteomalacia than any other known condition.

2. The disturbance apparently is nutritional in character.

3. Further studies are in progress for the purpose of determining the exact nature of the disease, its cause, and its treatment.

4. The term "osteomalacia" is used in its general sense and not in accordance with the textbook conception. Since the latter includes several characteristics which have not been observed in any of the large number of cases that we have studied, it has seemed unwise to designate these cases as a disease of which they are, at best, atypical examples.

The disease we describe compares in many respects with conditions that are being extensively reported in connection with studies in vitamin deficiency. However, practically none of these studies has been made on mature dogs, so that comparisons with such findings are not warranted at this time.

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DR. RANSOM HONORED

Dr. B. H. Ransom, Chief of the Zoological Division, Bureau of Animal Industry, has been elected a Foreign Corresponding Member of the Reale Accademia di Agricoltura di Torino (Royal Academy of Agriculture of Turin, Italy, founded in 1785 by King Victos Amadeus III of Savoy).

THE ETIOLOGY OF POLYARTHRITIS IN SWINE [1]

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GENERAL CHARACTER OF LESIONS

THE AFFECTED JOINTS are more or less enlarged. The stifle, hock, carpal and elbow joints are most commonly involved. On dissecting, the increase in size is found to be caused by excess of fibrous connective tissue and by irregularly shaped bony excrescences, the result of exostosis. In severe cases the exostosis leads to ankylosis.

The synovial fluid in the chronic cases with ankylosis is normal in color and amount. In the acute stage of inflammation the synovial capsule is distended with a serous fluid containing flakes or masses of fibrinous material. Occasionally the exudate is colored red by the presence of a few blood cells. Of the other blood cells present, lymphocytes are most common and are accompanied by a very limited number of polymorphonuclear leucocytes.

The articular cartilages exhibit erosions which may even excavate the bone. The synovial membrane is as a rule highly reddened and contains an excessive number of synovial villi.

PREVIOUS WORK ON ARTHRITIS IN SWINE

Glässer (1) describes a fibrinous inflammation of the serous membranes and joints of pigs. The animals are most susceptible during the first three months of life. Shipment and attendant harmful influences are regarded as predisposing factors of great importance. In the affected joints the synovial membrane is hyperemic and an increased amount of yellowish clouded synovia is present. Fibrinous masses are frequently observed in the joints, either lying loose on the synovial membrane or in suspension in the synovia. The organism regarded as the cause of the affection appeared to be a thin Gram-negative rod. Many rods appear somewhat bent, and a beaded appearance due to irregular staining is common.

[1] The observations herein described were made in the Pathological Division of the Bureau of Animal Industry, Washington, D. C. The present paper represents an effort to condense into moderate size a report on the subject containing original observations of autopsy material and animal inoculation experiments which are entirely omitted here.

Stützle (2) described similar joint lesions which he attributes to injury occurring during shipment. Attempts to recognize or isolate bacteria were uniformly negative.

Olt (3) has observed *Bacterium pyogenes* associated with polyarthritis in the hog, characterized by the presence of coagulated grayish red particles in the synovia, erosions of articular cartilages, excavation of bone beneath erosions, proliferation of the connective tissue of the joint capsule, numerous highly reddened synovial villi, exostosis with ankylosis and periarticular abscesses.

Holth (4) has observed *B. pyogenes* to be present either alone or in company with other organisms in the inflammatory exudate of suppurative joint inflammations of swine.

While the work being reported upon at present was in progress there has come to notice an article on chronic arthritis in swine by Sekiguchi and Irons (5). These writers report upon a number of cases in which short rods were present. They observe that the organism found by them differs from *B. pyogenes* in its failure to liquefy coagulated serum and gelatin. According to the description the organism in question differs but slightly from the one isolated by the present writer from a series of cases of arthritis herein reported, and is doubtless the same.

The present writer has observed a case of arthritis in a hog due to *B. pyogenes* and has carried out inoculation experiments with this organism in swine and rabbits. This case differs in etiology from a large number of pathological joints examined later, and also in that periarticular abscesses were present. However, it has in common with them the proliferation of bone, of synovial villi and of connective tissue, the erosions of cartilage and the reddening of the synovia and of the synovial villi so often encountered in the series of joints examined subsequently. The observations have been partially reported elsewhere (6,7). The organism in question is a comparatively rare cause of arthritis in swine and further reference here will be limited to the conclusions of the present paper.

CULTURAL METHODS EMPLOYED

In the work herein described the possibility of encountering *Bacterium pyogenes* in infected joints was in mind and necessi-

tated the employment of media which would satisfy the cultural requirements of that organism.

The cultivation of *B. pyogenes* required the presence of raw serum in the medium employed. Cattle serum was rendered sterile by filtration through a Berkefeld filter and was distributed with aseptic precautions in small test tubes, each containing about 5 c.c. of serum. When attempting to isolate the organism in pure culture, a tube of this serum was added to the cooled agar immediately before pouring the plates. Thus the serum constituted from 25 to 30 per cent of the volume of the plating medium.

Serum bouillon was prepared by pouring serum into tubes of common bouillon in an amount to constitute approximately 10 per cent of the volume of the mixture. The tubes of serum bouillon were tested for contamination by incubation.

Serum-agar slants for the cultivation of *B. pyogenes* were prepared by adding about 10 per cent of fluid serum to melted agar which had been cooled almost to the solidifying point.

ARTHRITIS ASSOCIATED WITH BACTERIUM ERYSIPELATIS-SUIS

A series of twenty-two sets of pig legs exhibiting various stages of arthritis were examined, with strikingly uniform bacteriological results. The first fourteen cases were sent to the writer by officials of the Bureau of Animal Industry meat-inspection service, in response to a request for specimens of polyarthritis without specifying the stage of development of the lesions. In consequence, a considerable number of joints contained advanced lesions with prominent bony enlargement. Subsequent experience has shown such joints frequently to be sterile. Material from pigs numbered 15 to 22 was selected in response to a request for joints exhibiting the early stage of distention of the synovial capsule by fluid. Examination of these joints resulted in the isolation of the same organism from at least one joint of 16 of the 22 sets of legs under consideration.

CULTURAL CHARACTERISTICS OF BACTERIUM ERYSIPELATIS-SUIS

The cultures isolated from joints of pigs 3, 5, 6, 8 and 10 to 22 were compared and found to be identical in morphological characteristics and in growth upon various media. The observations made are described below.

Morphology.—The organism is a nonmotile rod varying in length from 1 to 5 microns and is slightly less than 1 micron broad. It is stained uniformly by carbol fuchsin and by Löffler's alkaline methylene blue. When stained by the Gram method the color is retained. The organism does not possess the acid-fast characteristic. In a 24-hour bouillon culture some of the longer rods are observed to be slightly curved. The shorter rods show a tendency to cling together in pairs or more rarely in chains.

Bouillon.—Within 24 hours after seeding, the medium becomes slightly uniformly clouded with the collection of a whitish deposit upon the bottom of the tube.

Serum bouillon.—Within 24 hours the medium becomes slightly uniformly clouded, and a flocculent deposit collects upon the sides and bottom of the tube. At 48 hours the medium is still clouded. After four days the sediment increases in amount and forms a compact whitish mass. Upon rotating the tube on its long axis the sediment rises and forms a cloudy suspension consisting of dark particles of variable size.

Agar slant.—Growth is visible after 24 hours, but becomes more distinct on succeeding days. The path followed by the loop during seeding the medium is marked by the presence of numerous small separate grayish colored colonies. These are closely aggregated, become confluent to some extent, but the growth remains restricted. Under low magnification the colonies are seen to glisten, are slightly elevated and possess smooth, circular outlines. The water of condensation is slightly clouded and contains an abundant sediment which upon shaking causes a clouding with irregular shaped flakes.

Serum-agar plates.—After 24 hours of growth colonies are barely visible with the unaided eye. Under low magnification under the microscope they appear as small granular areas, brownish in color. After 48 hours colonies are plainly visible to the unaided eye as gray colored spots about 0.5 mm. in diameter. With the aid of a hand lens they appear as gray colored irregular shaped colonies. Under a 16 mm. objective they appear irregular in outline and in general have a granular appearance. The edges are rough and appear as if minute spines are projecting. Surface colonies are not detected.

Agar plates.—Growth on plain agar is not so rapid as on serum-agar. About three days are required for the colonies to become as distinct as two-day growth on serum-agar. Under a 16 mm. objective they are seen to be for the most part lenticular in shape and appear amorphous or finely granular in structure. The borders of the colonies are smooth and no protruding outgrowths are observed.

Six per cent glycerin-agar.—In slant cultures after 24 hours a delicate growth becomes visible on the surface of the medium, consisting of nonconfluent colonies. After 48 hours the growth increases slightly, but after longer periods no change is noted.

Serum-agar slants.—In slant cultures after 24 hours, growth becomes visible in the form of small, closely aggregated colonies. The condensation fluid becomes clouded with abundant sediment.

Gelatin.—In stab cultures after 24 hours at room temperature, a very faint line of growth marks the path of the needle. After three days, growth becomes much more distinct, but no growth is observed on the surface. After seven days the growth along the stab spreads into a broad column of liquefied gelatin [1] with fine material in suspension. There is a small amount of grayish white sediment in the bottom of the liquefied medium. The surface of the gelatin is indented by liquefaction.

[1] Liquefaction is said not to occur when the reaction of the medium is not exactly suitable, in which case the growth resembles a test tube brush.

In plate cultures after 24 hours a very few colonies are barely visible with the aid of a hand lens. With low magnification under the microscope they appear granular in structure and yellowish brown in color. After 48 hours considerable increase in the number of colonies occurs. With low magnification under the microscope they appear granular in structure and yellowish brown in color. After 48 hours considerable increase in the number of colonies occurs. With low magnification under the microscope the colonies appear straw colored, and circular in outline. The structure appears finely granular with delicate thread-like projections radiating from the colonies.

After growth for seven days the surface of the plate when scrutinized in reflected light shows shallow areas of liquefaction surrounding the colonies. Under a 16 mm. lens the colonies are straw colored, and display fine, colorless, thread-like projections radiating in all directions.

Fermentation of sugars.—One per cent of glucose, lactose and saccharose in fermentation tubes showed no evidence of growth after seeding and proper incubation. The three fermentation tubes after seeding with *B. coli* showed characteristic gas production.

Solidified cattle serum.—Growth in slanted medium consists of minute isolated colonies. No liquefaction is observed.

Milk.—No change is produced in this medium, nor in litmus milk.

Potato.—No growth is observed.

Indol.—No indol production is detected in Dunham's peptone solution.

ANIMAL INOCULATION

A pig inoculated intravenously first with a suspension of joint exudate and later injected twice with the organism in question developed a case of arthritis with extensive bone and connective tissue proliferation similar to the natural disease. The lesion was found to be sterile at the time of autopsy. Another pig inoculated intravenously with a pure culture of the organism on two occasions developed arthritis with distention of the synovial capsule, a condition typical of early stages of the natural disease. A pure culture of the organism was isolated from the lesion. Intravenous inoculation of grown hogs yielded negative results. It seems likely that older animals become more resistant to the infection than pigs one or two months old. Results of inoculation in rabbits are given in conclusions Nos. 8 and 9.

SIGNIFICANCE OF ARTHRITIS CAUSED BY BACTERIUM ERYSIPELATIS-SUIS

The first positive identification of swine erysipelas in the United States was made recently by Creech, who identified *Bacterium erysipelatis-suis* isolated from cases of a chronic form of the disease. This chronic type of swine erysipelas is known as urticaria or "diamond skin disease" because of the diamond-

shaped lesions on the skin. This lesion has long been well known to Government inspectors in the various slaughtering establishments.

Hoare (9) describing the disease as observed in England, observes that arthritis occurs in the mild form of the disease. Hutyra and Marek and also Friedberger and Fröhner mention deforming arthritis as resulting from swine erysipelas.

The lesions studied by the present writer are typical of those observed with great frequency in the principal hog-slaughtering centers of the United States.

The facts warrant the suspicion that the acute, highly fatal type of swine erysipelas may exist in this country, so far unrecognized.

SUMMARY AND CONCLUSIONS

1. *Bacterium pyogenes* has been isolated from one case of multiple arthritis in the pig. The pathological condition of the case in question differed from others in the series studied, in that periarticular abscesses were present.

2. Pigs inoculated intravenously with *B. pyogenes* twice developed suppurative lesions in the bones. Those of the legs were usually located at the point of junction of the epiphysis with the shaft. The synovial cavities of adjoining joints exhibited suppurative conditions and were connected with the bone lesions by fistulæ.

3. Introduction of cultures of *B. pyogenes* directly into the cavity of the femoro-tibial articulation of rabbits usually induces arthritis promptly.

4. In a large percentage of the joints examined there was found a small Gram-positive rod-shaped organism identified as *Bacterium erysipelatis-suis*, otherwise known as *Bacterium rhusiopathiae*.

5. Positive cultural results were obtained most frequently in cases exhibiting distention of the synovial capsule by serous fluid containing masses or flakes of exudate. Other conditions observed were lesions of the articular cartilages, the presence of numerous large synovial villi together with extensive proliferation of connective tissue and bone. The viscid exudate often was slightly colored by the presence of blood cells. Among other cells present, lymphocytes were most numerous. Polymorphonu-

clear leucocytes were present in only small numbers. Microscopic examination of synovial exudate revealed but few of the rod-shaped organisms, if any.

6. In joints exhibiting more advanced lesions such as excessive exostosis with ankylosis the synovial fluid was normal in appearance and generally sterile.

7. Arthritis has been produced in a pig by intravenous injection with *B. erysipelatis-suis*, and the same organism was isolated from the lesion at autopsy.

8. The femoro-tibial articulation of a rabbit was infected with the organism in question by direct introduction of culture into the joint cavity.

9. One intravenous inoculation of the rabbit with the organism induced infection of the stifle joint characterized by the presence of an excessive amount of grayish exudate. A pure culture was recovered.

10. It is believed that *B. erpsipelatis-suis* bears an etiological relation to arthritis in the pig.

11. As all the observations herein recorded are based on material from abattoirs (leg only), no conclusions can be drawn regarding possible mortality associated with the form of swine erysipelas causing arthritis.

12. It is desirable that field observations be made with reference to the possibility of the occurrence of outbreaks of swine erysipelas associated with heavy mortality.

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THE PREPARATION OF TUBERCULINS [1]

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THE ERADICATION and control of bovine tuberculosis fundamentlly involves the use of biological preparations which are universally recognized and designated as tuberculins. While tuberculin was originally prepared by Robert Koch in the hope that its use would result in a beneficial therapeutic action against human tuberculosis, this use has been practically superseded by its use as a diagnostic agent. It is, then, for the purpose of diagnosis that this product finds practically its only use in veterinary medicine.

TYPES OF CULTURES USED IN THE PREPARATION OF TUBERCULIN

Tuberculin is the product of the metabolic activity of *Bacterium tuberculosis.* It is essential, therefore, in order to obtain the products of growth of the organism that pure cultures be used in its preparation. While three types, the human, bovine and avian, are quite clearly differentiated by their growth and culture characteristics and their more or less distinct specific pathogenicity for their particular hosts, this specificity does not appear to be followed with respect to the tuberculin reaction. The human type is not only suitable for use in the bovine diagnosis but is quite generally used for the preparation of tuberculin because of its more rapid and abundant growth on artificial media than are bovine strains. The Bureau of Animal Industry in the preparation of immense quantities of tuberculin has quite regularly employed human strains of the organism. Other laboratories employ bovine strains. Our own laboratory uses one culture from a bovine source, originally obtained from Holland about twelve years ago.

The laboratory of the North Dakota State Serum Institute employs a culture of avian origin for the preparation of tuberculin for use in testing fowls. The corelationship between the various types of tubercle bacilli is such that it is clearly evident that they are closely allied, so that reactions with tuberculin

[1] Presented before the twenty-fifth annual meeting of the Minnesota State Veterinary Medical Association.

prepared with one strain may be expected where infection exists with the heterologous type as well as with the homologous. The avian type is more differentiated than the other forms, so that it appears that a greater number of positive reactions may be obtained in fowls when tuberculin prepared with the avian strain is used.

The virulence of a culture is apparently not a prerequisite for its suitability for use in the preparation of a satisfactory tuberculin. Some authorities prefer to use virulent cultures. It appears that cultures maintained for a considerable period of time on laboratory media become less virulent for experimental animals. A more certain criterion of the usefulness of a culture is its ability to produce a tuberculin which gives a strong positive reaction in routine testing of infected animals. Obviously a minimum of nonspecific reactions should be expected.

The primary isolation of the organism presents some difficulties. Briefly, however, it consists in the inoculation of guinea-pigs with infected material and, after infection has developed, the transfer of small particles of infected tissue to suitable media, of which a number of forms are now in use. Successive cultures usually develop quite readily so that a perceptible amount of growth may be observed on suitable media within ten days following inoculation.

Cultures of both the bovine and human strains have many characteristics in common and for the purposes of this discussion the points of differentiation are hardly of interest. Both strains grow on the surface of the broth which is universally used for the preparation of tuberculin. The film is at first delicate and veil-like, later forming a pellicle of a dull white color. If growth is not interrupted the pellicle becomes quite thick and if disturbed masses fall to the bottom. A peculiar odor quite aromatic and quite characteristic is observed of such cultures. The broth cultures of the avian strain are inclined to be more slimy. While a surface pellicle is formed, growth is by no means confined to the surface as is noted with the human and bovine strains.

PREPARATION OF CRUDE TUBERCULIN

The composition of the media employed for the cultivation of the tubercle bacillus used in the preparation of tuberculin

varies somewhat in various laboratories. Because of the similarity in composition of media so employed, it is sufficient to mention that that which we use in our laboratory contains in each liter 1 per cent of sodium phosphate (Na_2 HPO_4), 3 grains of beef extract and 5 per cent of glycerol. The reaction is adjusted to faintly alkaline phenolphthalein. The broth is measured into flasks, which are plugged with cotton, sterilized, and then incubated for several days to show the presence of contaminating organisms. Such medium has for a period of several years given satisfactory results in the preparation of tuberculin which apparently gives strong positive reactions.

The Bureau employs a meat infusion broth, but inasmuch as such animals are largely byproducts of various investigational work, the cost of broth preparation is not materially increased.

Inasmuch as tuberculosis is strictly aerobic, the potency of a tuberculin is directly proportional to the surface area of a given volume of culture medium. Erlenmeyer flasks of 300 c.c. capacity and containing 100 c.c. each of broth fulfill the aforementioned factor.

Flasks are seeded by transferring a small amount of growth from a young and actively growing culture to each flask of broth. Care is exercised to float the mass of bacteria and thus permit the more ready growth of the new culture. The flasks are then incubated for a period of about three months. Growth in the meantime should have developed abundantly, with the entire surface of the broth covered with a dense, heavy, crumpled, dry appearing pellicle which crumbles when disturbed. The broth beneath the surface growth should remain clear except for precipitated masses of the tubercle bacillus. Cloudiness or turbidity of the medium indicates contamination, and such flasks should be rigorously excluded in the final preparation of tuberculin.

The preparation of crude tuberculin remains today substantially the same method as outlined by Koch in 1890. Certain slight modifications have been introduced in some laboratories. This product prepared from the ripe culture broth is designated as crude tuberculin "brute," "Koch's old tuberculin," "old tuberculin," "concentrated tuberculin," or as "O. T." This product is the basis of the various tuberculin preparations used in veterinary practice. The ripe flasks of tuberculosis cultures

are sterilized in the Arnold sterilizer for three hours so that organisms are destroyed and are no longer capable of producing an infection. The clean uncontaminated flasks of sterilized culture are then filtered, and the resulting clear amber solution is evaporated on the steam bath to one-tenth of the original volume of the culture medium before incubation. This heavy brown liquid, containing a high percentage of glycerin, is filtered clear, and constitutes the crude tuberculin for further use. The degree of concentration varies among different laboratories, some concentrating only sufficiently to allow for the addition of the preservative. The dosage should be determined as quantity of "old tuberculin," however, for the purpose of uniformity.

KINDS OF TUBERCULIN USED

Present methods of tuberculosis diagnosis involve the use of but three forms of tuberculin. These are prepared from, or the dosage is based fundamentally on, previously prepared crude tuberculin.

Subcutaneous tuberculin is prepared by diluting crude tuberculin with 0.5 per cent phenol so that the desired amount of the crude tuberculin is contained in the usual dosage. The Bureau tuberculin contains 0.5 gram of crude tuberculin in each 4 c.c. That prepared by the North Dakota State Serum Institute contains 0.6 gram in each 4 c.c. of the final dilution. The clear, diluted subcutaneous tuberculin is distributed in vials or ampules, sterilized, sealed, and is then ready for distribution.

Tuberculin for the intradermal test is prepared from "old tuberculin" by dilution with at least an equal volume of distilled water. A slightly greater percentage of water (80-120) does not decrease the efficiency of the product and yet renders it less viscid, so that it will flow more readily through the smaller caliber needles. Phenol, which is more or less irritating to the tissues, is not added in either intradermal or ophthalmic tuberculins. It is possible that when purified precipitated tuberculin can be manufactured on a more economic scale this product will be redissolved and used for intradermal purposes.

Ophthalmic tuberculin is prepared from partially concentrated tuberculin by precipitation methods. Most laboratories use absolute alcohol for this purpose. The active principles which induce the reaction are carried down with the precipitate

and are incorporated in tablets by the aid of lactose or milk sugar. The precipitation serves to exclude the glycerin, thus making a purer end-product and likewise removing probable sources of error in the interpretation of results. The absolute alcohol method of precipitation involves a very expensive process, and it is highly desirable to devise other means by which a potent, purified product can be produced on a more economic basis.

STANDARDIZATION

The true indication of the potency of tuberculin is its ability to induce vigorous, positive reactions in routine testing under field conditions. Attempts have been made to standardize the product by means of laboratory methods, but so far with little success. Methods have been used wherein tuberculous guinea-pigs were injected with varying doses of tuberculin. The potency is then ascertained by the amount necessary to kill infected animals. Obviously this method is crude, costly, and difficult of application and is probably but little used. The fact remains that we must still rely very largely for the determination of potency on care and skill in preparation, with the careful observation of certain factors in that process, and the fact that it is efficient when used in the field.

THE TUBERCULIN REACTION

The biological mechanism of the various tuberculin reactions can best be explained on the basis of the anaphylactic phenomenon. While this is generally assumed, some authorities oppose this view. However, there is certainly a generalized hypersusceptibility in tuberculous animals which is at least analogous to the phenomenon of anaphylaxis. The tubercle bacilli are considered as stimulating the body cells to produce an antibody or a ferment in the nature of an immune body or amboceptor which splits the tubercle protein, which is of a low degree of organization—probably a polypeptid—liberating a protein poison whereby the various reactions are induced. The general reaction may be explained as due to a general effect of the poison on the body cells. The local reaction is caused by a concentration of the toxic end-products at the site of administration of the tuberculin. The appearance, then, of the local and systemic

reactions, which we recognize as positive tuberculin reactions in infected animals, from contact with specific antigenic substances which at least in similar quantities produce no effects in healthy animals, is at least a parallelism if not itself a true manifestation of the anaphylactic phenomenon.

Dr. M. J. Harkins, of Conshohocken, Pa., is now engaged in work with Dr. J. A. Kolmar in connection with the Dermatological Research Laboratories of Philadelphia.

Dr. R. W. Pechin was elected Burgess of Phoenixville, Pa., last November. He is the youngest Mayor in the United States.

Dr. George Hilton attended the ninth annual convention of the Western Canada Live Stock Union, held at Regina, December 14 and 15, and delivered an address on "The results obtained under the accredited herd plan, and the proper method of housing live stock, with a view to preventing the spread of infection."

A meeting of the field officers of the Health of Animals Branch, working in the Province of Ontario, was held in the Toronto office on December 30, to discuss matters relating to the eradication of tuberculosis, at which Veterinary Director General Torrance presided.

Dr. J. B. Still, of Winnipeg, addressed the members of the Manitoba Cattle Breeders' Association at their annual meeting in Brandon, on January 6, on the accredited herd plan.

Dr. Seymour Hadwen and W. F. Bancroft, of the Bureau of Biological Survey, accompanied by Dr. B. H. Ransom, of the Bureau of Animal Industry, spent March 13-15 at the Government Quarantine Station, Athenia, N. J., examining 60 head of reindeer imported from Norway for the State Conservation Commission of Michigan. The deer were held in quarantine from March 10 to 25, and will be turned loose in northern Michigan for propagation and restocking purposes. These deer are being introduced by State authorities. The Federal work with reindeer is being carried on in Alaska.

HYGIENE AND SANITATION IN CARE OF YOUNG ANIMALS [1]

By E. S. DEUBLER

Penshurst Farm, Narberth, Pennsylvania

THE SUBJECT of hygiene and sanitation is such a large one that I could not hope to cover it thoroughly, and therefore will speak only of some personal experience in the care and management of farm animals, chiefly dairy cattle and swine.

There is no doubt that while the animal is young hygiene and sanitation are of the greatest importance, and that the mortality in all animals is greatest during the first month of life. We should even go back to the time before the animal is born and consider the pregnant mother, if we hope to have a good, strong, vigorous offspring at birth. Among the influences of the dam affecting the fetus we can mention food, exercise, stabling, milk production, disease, etc.

As we become experienced in handling pregnant animals and young ones we are sure to develop some theories which are hard to prove or disprove, because experiments are hard to control. Therefore I am not sure whether it is safe or unsafe to mention them.

The feed of the pregnant dam is important, specially so in handling dairy cows, where the milk-producing function has been highly developed. These cows have such a strong tendency to convert food into milk that they are hard to dry off, and therefore do not fully nourish the fetus, which is apt to be born emaciated and weak. By widening the ration and feeding only a small quantity of digestible protein, as corn, oats and hay, in liberal quantities, the cow will usually dry off. I am very partial to corn meal or hominy as a desirable feed for pregnant cows, and believe that we will usually find most good dairymen feeding too narrow a ration because they are trying to stimulate milk production. It is much easier to make large production records if we disregard the future usefulness of the cow or her breeding functions, and we should be on our guard when ambitious herdsmen are trying to make big records.

[1] Presented at the Conference of Veterinarians held at the School of Veterinary Medicine, University of Pennsylvania, February 28 and March 1, 1922.

On the other hand it is more common to overfeed pregnant sows with corn, ear corn being such a convenient and universal feed for hogs. Breed sows are often fed almost wholly on this grain, with little protein, and consequently get too fat and produce weak pigs. An addition of alfalfa hay, tankage, linseed meal or wheat bran will prove of great value in such cases.

Much has been said recently of the value of mineral preparations in the prevention and cure of almost all breeding problems. No doubt there is a field for such preparations, because many rations are deficient in mineral matter, but when one reads in an advertisement, "Cows supplied with special cattle minerals insure strong, healthy calves and all losses from white scours and such conditions are eliminated," we must conclude that the claims are overdrawn.

Exercise of the pregnant mother is important. Cows receiving plenty of exercise as a rule drop stronger, more vigorous calves. A breeding herd should be turned out every day, if only for half an hour. Some veterinarians claim to have reduced the percentage of retained placenta in herds by abundant exercise of the cows. It is important to exercise the pregnant brood sow, and this may be accomplished by feed in the opposite end of the lot from the sleeping quarters, forcing the sow to walk for her feed.

A dry, well-lighted, well-ventilated stable is without question conducive to the health of any animal, and especially is this true in the case of pregnant or new-born animals. In large herds the ideal method is to place the pregnant animal in a dry, clean box-stall a few days before parturition, and feed light, laxative feeds.

At the time of parturition it is well to be present and render such assistance as may be necessary. The usual mistake, however, is to try to aid or interfere too soon and thereby excite the mother.

With cows we make it a practice to leave the calf with the dam for three or four days, except in a case of milk fever, or where the mother would injure her young or for some similar reason. The colostrum is nature's food for the new-born, but in handling a Bang herd at the State farm we raised many calves that were never allowed to nurse their dams, and found castor

oil would take the place of colostrum where a laxative was required.

When it is necessary to feed a new-born calf by hand, give it the mother's milk if possible, or the milk of a cow fresh for a short time, and be extremely careful not to overfeed. One pint of milk three times a day is enough for the first two days, and then increase very slowly, always reducing the milk promptly on the first signs of indigestion. Two quarts of milk three times daily is enough for a strong calf, two to three weeks old, if the calf is to be raised. Veal calves may have more. The calf should have hay when one week old. The more roughage it eats the less liable it is to indigestion.

The most critical period of animal life is the first few days after birth, and with cattle white scours is the most common disease and the one that causes the greatest losses. The larger and better bred the herd the greater the trouble with white scours, and many men have found it impossible to raise a single calf for long intervals. I have seen many calves born as strong, large and vigorous as one could wish, and in forty-eight hours be dead with white scours. Some of the calves are very valuable and the owners willing to go to any expense to save them, but they are usually beyond help when the veterinarian arrives. Calf-scour serum was used with some success, but it was necessary to inject the calf within an hour after birth. I found the best results with serum by injecting intravenously as soon after birth as possible. Later, I found a 100 per cent perfect method of preventing white scours by hygiene, and if you will bear with me I would like to tell you how this method developed. It disproved some old theories about white scours and is so easy that you would probably not carry out the details completely unless the whole story were told.

When calf scours was at its worst in a large herd of 100 pure-bred dairy cows, of which I have had charge for the past ten years, we found that some of the calves born out in the field would live, if we did not put them in the calf barn too quickly after birth. Again, when by chance some cows calved in a horse barn which was used for calving on account of other box stalls being occupied, the calves lived. Therefore in summer we let as many cows calve in the field as possible, and kept calves out until past the scour period, or about two weeks. In winter we

took cows to the horse barn to calve, but found that when three or four cows had calved in any one box stall, the next calves born in that stall would probably develop scours. Having four or five small barns on the farm, we used all for calving, with like results. We built a new calf barn, light, warm, dry, well ventilated, consisting of two rooms separated by a feed room. In one room were six box stalls with pipe partitions for calving cows and twelve individual calf stalls. The calves did well in this barn for a short time, then all new-born died of scours. We disinfected each stall after every calving, removed all bedding, scrubbed floor, side walls and partitions thoroughly with strong disinfectant, but the trouble persisted. We washed the cow before calving, tried to catch the calf on a clean blanket, tied the navel quickly, painted cord with iodin, etc., but still nearly all died. Occasionally we removed everything from this room, scrubbed thoroughly, sealed doors and windows and fumigated with formaldehyde. Always after such a fumigation the first few calves born would live. We then disinfected as often as possible, but this being the maternity building, we could not vacate it entirely for fumigation as often as we liked. We built a maternity stable and arranged it so that each stall was independent, having an outside door and no direct communication with other stalls. The doors and windows were designed to be tightly closed, for fumigation. The cows were put in one of these clean stalls a few days before calving, where they calved, and were left with the calf for a week or ten days, or if the cow was removed the calf was left there until ten days to two weeks old, when it was removed to the calf barn. The cows are always fairly clean, but were not washed or disinfected before being placed in the maternity ward or stable. The calf had no special attention; navel was not tied or disinfected. When cow and calf were removed, everything was removed from the stall and it was disinfected and fumigated. Fresh bedding was put in and the stall was ready for another cow.

This plan has been in operation at Penshurst since 1912, with complete success in controlling calf scours and calf pneumonia, and it has assisted greatly in getting rid of abortion. You might think that the infection has been killed out on the farm, and there was no further danger. I think there is always

danger of scours in a large herd. We have sometimes left a stall without disinfection and found the calves born in this stall became infected, or we have been obliged to put the young calves in the calf barn before they were one week old, and some of them have shown symptoms of infection. The same plan has been used on other farms, where the losses from white scours were heavy, and with complete success.

Calves older than ten days are subject to other infections, scours, pneumonia, etc., which may go through the entire lot. I have found nothing better to check these epizoöties than to remove the healthy animals to a clean stable and disinfect the infected stable. The stable itself is a big factor in the cause of all these epizoöties, a damp, poorly ventilated stable being an ideal incubator.

A few days ago a friend asked me to look at his calves, two of which are now in this hospital. The barn was a new one, well arranged and well built, except the calf stable, which is a one-story wing with wooden walls and roof without air space. There were several large windows but no ventilating system. There was a concrete floor. The weather had been cold and snow covered the roof. The walls were soaking wet and drops of water standing over them. It is believed that these conditions had much to do with the cause of the trouble. A stable need not be elaborate or costly, but it must be dry. Many expensive stables are unhealthful. If a young animal is dry it will stand severe cold.

Many of the diseases of young pigs are caused by wet or damp quarters. As the animal grows older we always find that it thrives best under good hygiene and sanitation and by the exercise of plain common-sense methods. By these means we may avoid disease and setbacks in growth.

Possibly we may consider all animals young animals until they produce young.

I would like to touch on one phase of that dreaded disease, abortion, which I believe can be controlled by hygiene. In many herds the greatest losses from abortion occur among the bred heifers. It is quite a common occurrence to find more abortions of the first calf than any other. A few years ago we were told that this was because the calves were fed milk containing the Bang organism, which they harbored in their bodies, until

they became pregnant, when the organism became active in the uterus and caused abortion. We were advised to feed all heifer calves pasteurized milk to avoid these results. I never believed this theory, and took some heifer calves and fed them until they were weaned wholly on the milk of cows which had aborted. These heifers all calved normally. I believe that if a heifer is kept away from infected cows and their products and infected stables, from six months before she is bred until the time she is due to calve, there is no danger of her aborting her first calf. These heifers should be kept in pastures and stables not used by cows, and they *must not* come in contact with infected cows or infected food. One experiment which I made about five years ago gave very clear evidence on this point.

A group of twenty heifers was raised under identical conditions until two months before breeding. Ten were placed in barns with the cow herd, and the other ten in a barn that was never used for anything but young stock, and with no connection with the breeding herd. They were all bred, and 70 per cent of these heifers in the cow barn aborted their first calf, while 100 per cent of the heifers bred in the heifer barn calved normally. Following this experiment all the heifers on this farm are bred in the heifer barn, and with an average of 15 to 20 heifers calving yearly none have aborted their first calf.

All present have probably read Bulletin 363 of the Pennsylvania Department of Agriculture, on "Infectious Abortion," issued in December, 1921. This bulletin gives twenty-six excellent recommendations for the prevention of abortion, and twenty-four of the twenty-six apply to hygiene and sanitation.

I am sure we all realize the importance of hygiene and sanitation in animal husbandry, and hope the time will soon come when owners of herds will recognize that it is better policy to employ veterinarians to keep their herds healthy than to treat disease and correct troubles that might have been prevented.

At the suggestion of the Post Office Department the Bureau of Chemistry made tests of several so-called sex detectors, with the result that all the manufacturers have gone out of business. Tests on eggs and other things by a number of persons showed that all the instruments were useless.—*Southwest Plainsman.*

SOME THERAPEUTIC SUGGESTIONS

By E. T. Baker, *Moscow, Idaho*

MANY VETERINARIANS neglect the value of certain distinguishing colors and odors in medicinal mixtures. By using the same color and odor the client becomes accustomed to them and is often enabled to ask for "the same medicine I got last year" long after the veterinarian has forgotten it. It is in the nature of the idea used by the large manufacturing firms, such as the Victrola Company, which has featured the dog listening to his master's voice. Neighbors in talking with one another often remark that "that red medicine I got from Doc sure did the work," and straightway others want it. The practitioner who leaves a four-ounce bottle of turpentine, let us say, or any other common medicine without any distinguishable odor and color, is not only doing himself and his profession harm, but it reacts on his client as well. The latter begins to use this for everything, from colic to milk fever, and soon loses confidence in everything and everybody, including the veterinarian and himself.

The older practitioners, who possessed plenty of business sense and some of them considerable hokum, amassed the coin just the same. In order to make the graduate capable of competing with the empiric he must have some business training, and it would seem to a man up a tree that our colleges often teach everything but how to make a living!

The various oils, such as turpentine, eucalyptus, cajuput, mineral, raw linseed, can be colored a beautiful red with alkanet root. Take a dozen pieces of the root (the leaves and dust are worthless) and tie in a small piece of gauze with a foot of string attached. Soak this in a pint of the oil twenty-four hours, and this will be sufficient to color several gallons. One can also procure various oil-soluble colors at very reasonable rates.

To deodorize oils, the synthetic oil of wintergreen (methyl salicylate) and the synthetic oil of bitter almonds (benzaldehyde) are two very good and penetrating ones. Other essential oils can also be used, but these are two old stand-bys.

Fruit colors, such as are used in bakeries, are nonpoisonous and very good for use in aqueous solutions. These come in pastes, tablets and liquids, the latter being the most convenient. Red, green and orange are three common ones.

The common white lotion, for example, can be colored a beautiful green, and with the addition of an ounce of benzaldehyde to the gallon one has a very distinguishable product, easily remembered by the client, and much more efficacious than the plain lotion.

The white liniment, when made up with 8 ounces each of oleum terebinthæ and aqua ammonii, 2 ounces each of oleic acid and oil of methyl salicylate, with water (colored red) enough to make 1 gallon, forms a beautiful pink to red solution. To get a more creamy lotion one can dissolve several ounces of ammonium chloride in warm water and mix; let stand twenty-four hours.

Formalin, used so extensively in tympanites, can also have red coloring matter and benzaldehyde added. One-half ounce of this can be put in pop bottles or pint bottles, filled up with water, and kept for emergencies. These can always be kept in one's medicine room, and when some town cow swells up during your absence on a call, the wife can dispense it and greatly alleviate the excitement.

A very useful mixture that can be used for colic or indigestion in horses, bloat in cattle or digestive ailments in pigs or sheep is the following: Twelve ounces each of sulphuric ether and chloroform, 4 ounces oil of eucalyptus and camphor (a saturated solution), with oleum terebinthæ (colored red) q. s. 1 gallon. One to four ounces of this can be given in water, oil or "straight" with a syringe or in an ounce capsule. Of course other drugs, such as aromatic spirits of ammonia, nux vomica, chloral hydrate, hyoscyamus, belladonna, stramonium, dioscorea, colocynth or pilocarpus can be added. But the above is an excellent vehicle and can be used as an all-round medicament. It is also useful in rubbing over the back of a cow down with milk fever, and will often induce her to take up her bed and walk, if she be of the stubborn type. If you are caught without any liniment in an azoturia case and the client demands something to "rub over the kidneys," give him a couple of ounces of this.

Another excellent combination for wire cuts, preventive for maggot infestation (particularly in sheep), is to pour 2 ounces of lysol or liquor compound cresolis into a pint bottle, add 20 grains of pyoktanin blue and shake well, 2 drams benzaldehyde, and fill the bottle with kerosene.

Solutions of potassium iodide can be of a green color but

odorless, Fowler's red, while the potassium bichromate supplies its color.

A very satisfactory application for collar galls is the mercuric ointment, 50 per cent. By adding charcoal and benzaldehyde, the efficacy is much improved.

The alum treatment in laminitis is enhanced by adding some charcoal, aloes and a few crystals of potassium permanganate.

For mammitis one can use equal parts linimentum saponis, fluid extract phytolacca and cottonseed oil, with a dram or so of methyl salicylate to the pint.

For an absorbent for general use in sore tendons, swellings, etc., the following is excellent, but rather expensive: Iodine crystals and potassium iodide, of each 4 ounces; triturate these in a separate mortar with a little alcohol or spirits camphor; gum camphor 8 ounces and menthol 2 ounces; triturate these in another mortar with a little alcohol; and ichthyol and methyl salicylate, of each 4 ounces, mixed up separately. Warm 5 pounds of yellow petrolatum, and mix the first mentioned in well, then the contents of the second mortar, then the third. An elegant preparation is the result, and its uses are many. In a severe sprain or bruise on oneself, the writer does not know of any better treatment than to add a half ounce each of belladonna and aconite to a pint of white lotion, bind on for twenty-four hours, keeping saturated the inner fold of cotton, and then applying this ointment several times daily.

Dozens and hundreds of other successful combinations, inexpensive and yet doing the work, could be given, but space forbids. With the rapid increase in price of most of our drugs and with a very slow return to normal, more headwork must be used. With alcohol for medicinal use almost impossible to procure, the faucet has become a general favorite. With the field of practice being rapidly narrowed by salaried officials, county agents, patent medicines, and agricultural graduates with just enough veterinary science to make quacks of them, the practitioner faces a not very rosy future. Even our various associations are paying very little attention to the practicing veterinarian, so that the latter must use what little brains he possesses in order to survive. These therapeutic suggestions are given to help in the general cause. The writer also wishes to commend to the profession various laboratories maintained by veterinarians. These

firms are putting out specialties, biologics and drugs in better forms and even cheaper than we can make them up ourselves. Then again, they maintain a bacteriologic department, where we may come with our puzzling cases, and perhaps are the best aids the practitioners have at present.

A good many of our citizens will wonder at the superfluous energy of the Federal Government in preparing and issuing a pamphlet on "How to Keep Your Cellar Dry."—*Louisville Times.*

The fashion news from Paris is that the dresses over there are not full. Over here they are full and running over.—*Washington Post.*

More flies are caught with molasses than with vinegar, but there is something terribly conclusive in a swatter correctly applied.—*Journal of the American Medical Association.*

The British Government has installed at the Liverpool docks a small experiment station for the disinfection of wool and hair against anthrax bacilli.

A conference for the international standardization of serums has been held at London by the Health Committee of the League of Nations. Several subcommittees were appointed to study special problems and collect data. Another conference will probably be held during the present year at the Pasteur Institute of Paris.

An American motion picture showing the production of pure milk was recently shown in a Paris public school with the object of interesting the French public in improvement of the milk supply.

An Australian veterinarian reports a case of suffocation of a pony by a snake which crawled up the nostril and into the windpipe. The report does not state whether or not the country is under prohibition.

SWINE DISEASES AS WE FIND THEM IN THE FIELD[1]

By W. H. DREHER
Oregon, Wisconsin

I WONDER how many of us ever stopped to enumerate all the ailments that the hog is heir to. I shall not attempt to mention all of these diseases, but shall touch only on the most important ones that we meet with in practice. The object is not to bring out any startling discoveries as regards swine diseases, but rather to create a discussion which will be both interesting and beneficial to us all.

Investigators of swine diseases differ in so many ways that when we go into a herd of sick animals to make a diagnosis we are often very much at sea as to what the trouble really is. Therefore we must take our time and look well into the conditions that confront us, especially as to sanitation, housing and feeds, and make a careful postmortem examination if possible before making a statement to the owner as to what his herd is really suffering from. The time is not long past when about all we looked for in a herd of sick hogs was hog cholera; but not so today. We must be able to differentiate between hog cholera, necrotic enteritis, hemorrhagic septicemia, infectious rhinitis, broncho-pneumonia or swine influenza, and many others.

Ofttimes the trouble will be found to be due to improper care or feeding, or to improper conditions in the houses or sheds. Large quantities of fine dust that accumulates in hog houses during the summer often produce a mechanical pneumonia that gives no end of trouble.

I shall not dwell on hog cholera, for I feel that we all are familiar with that disease, and we have had more or less experience in its control.

INFECTIOUS NECROTIC ENTERITIS

Infectious necrotic enteritis is a specific infectious disease of swine. Many differences of opinion exist as to the etiologic factor, and as far as I have been able to learn no one particu-

[1] Presented at the annual meeting of the Wisconsin Veterinary Medical Association, Madison, Wis., January 19, 1922.

lar microorganism has yet been isolated from the bodies of pigs that have succumbed to this affliction. The *Bacillus necrophorus* has received credit of being the causative factor, but it does not seem plausible that one organism could produce so many lesions in different parts of the body. Dr. Dimock, of Kentucky, claims that of all the organisms which have been found associated with this disease the one against which there is the most incriminating evidence is the *Bacillus suipestifer.*

Symptoms.—This disease is characterized by a profuse and persistent diarrhea. The respirations are normal, with temperatures as a rule lower than in cholera, yet occasionally we find it as high as 106° F., though rarely. The appetite of affected pigs is very slightly, if at all impaired. Visible mucous membranes are normal or anemic. The skin of the neck, shoulders and back becomes scurfy and sometimes cracks. The affected animals remain active on their feet, but emaciation develops slowly and the animal seems to dry up. The progress of this disease through the herd is slow.

Treatment.—My experience in treating this trouble has been anything but gratifying. I have used bacterins and all of the medicines that were ever suggested, I suppose, but to no avail. When once a pig becomes affected there seems to be no help for him. Prophylaxis is very important, however. Give the herd an entire change of quarters. Put them in a fresh pasture away from all hog yards, if possible, and thoroughly clean and disinfect all hog houses and feeding floors, and do away with the old hog wallows by filling with fresh gravel.

Postmortem Findings.—A diffuse necrosis of the mucous membrane lining either the large or small intestine is the outstanding lesion. The membranes may be much thickened and tough, or, as is frequently the case, they resemble a false membrane which is dark colored and when removed disclose a very inflammatory condition beneath. Often the membranes lining the intestines have become so thickened as almost to occlude the lumen of the bowel.

RHINITIS

Rhinitis is an infectious disease affecting the upper air passages of the pig. This disease has given me considerable trouble in the past few years on certain farms, and each year the losses on these particular farms have become greater. It affects the

pigs when young and oftentimes gets a good start before it is noticed by the owners.

Symptoms.—This affection is characterized in the beginning by a catarrhal inflammation of the nasal mucous membrane, and at the time the animals snuffle or sneeze. Later the cartilages and the bones of the face become involved and bulge, presenting a peculiar appearance known as "bull nose." I have seen this particular bulging attain considerable size, even as large as an apple.

While it has never been determined what particular micro-organism is the primary cause of this condition, the one most frequently encountered and the most easily isolated, according to Dr. Dimock, is the *Bacillus pyocyaneus.* The mortality is low, yet the affected pigs grow and never amount to anything.

Treatment.—Hygienic measures give by far the best results. Again I have tried bacterins and different medicinal agents, with but very little if any success. Dipping in a strong solution of potassium permanganate in the early stages seems to benefit, but the most important thing to do is to remove the herd from the infected pens and place them in a grass pasture with clean sleeping quarters, troughs, etc., and plow up the old yards if possible. It has been suggested by some investigators to change the breeding stock.

"SWINE INFLUENZA" OR "BRONCHO-PNEUMONIA"

I think it was about three or four years ago that we were confronted with a condition in hogs that had us all guessing, and I am not so sure that we are not guessing still. Considerable difference of opinion exists at this time among investigators of swine diseases as to whether hemorrhagic septicemia and swine influenza are not one and the same disease. Dr. C. P. Fitch, for instance, says: "This disease does not exist among swine," while such men as Drs. Edwards and Murray of Ames, Iowa, and Dr. J. S. Koen of the Bureau of Animal Industry, all recognize this condition as influenza. Dr. Edwads says: "The bipolar organism plays little if any part." Dr. Murray of the same place substantiates this claim and has isolated with marked regularity a micrococcus from the bodies of pigs that have succumbed to this disease, has made cultures of them in the labora-

tory, and has produced by injections of these cultures the same conditions in susceptible pigs.

Symptoms.—A large number of the animals in a herd appear to be extremely sick within a very short time. Invariably the owner will tell you that the pigs have cholera and will want you to come in a hurry. The affected animals become gaunt and have a pronounced and peculiar dyspnea and thumpy breathing. The sick pigs lie around in pairs, or groups of four or five, and when driven up they have a heavy, painful cough and will move about a short distance before they lie down. There is a marked muscular soreness with oftentimes a paralysis of the hind quarters. When these pigs are lifted to their feet they squeal. More or less congestion of the eyes is present, with a watery discharge from the eyes and nose. The temperature runs very high in this condition, often up to 108°F. There is loss of appetite, with a very rapid and pronounced loss of flesh; in fact the flesh seems to melt from the body. This condition lasts, as a rule, about four or five days, and about the time you expect the animals to die they begin to recover.

While the progress of influenza through the herd is rapid, yet the mortality is low. In most herds not more than 1 per cent will die, yet in my experience I would place the losses at about 2 per cent.

Treatment.—Respiratory stimulants such as the guaiacol and camphor preparations have given me good results. Dry sleeping quarters that are free from dust are essential. Plenty of fresh, pure water and very little if any corn must be fed.

Postmortem Findings.—A bluish discoloration of the skin of the belly and a considerable amount of froth in the nostrils are characteristic. A marked congestion of the mucous membrane lining the air passages, with a considerable quality of reddish, frothy liquid filling the bronchioles is usually found. We find a lobular pneumonia, which gives to the lungs a mottled appearance. The lymph glands, particularly the cervical, bronchial and mediastinal, are swollen and juicy, with few if any hemorrhages. The heart may or may not show the hemorrhagic areas. There is usually a slight inflammation of the mucous lining of the stomach. The bladder is distended and may show hemorrhagic areas, but petechiæ are seldom found.

UMBILICAL HERNIA OPERATION IN THE MALE PIG [1]

By O. N. SCHULTZ, *Latimer, Iowa*

THIS is a surgical operation which might be regarded by some as being of a minor importance, and yet we are frequently called upon to do it, and in valuable animals a successful operation brings much satisfaction to the owner.

I have used two methods for reducing such hernias. The first method, which consists of opening the hernial sac and suturing the ring, has not been successful with me because of recurrence. I think the reason for recurrence is that the ring is so rigid that too much traction must be applied to bring the edges into apposition, in consequence of which the edges are liable to pull apart before they have united by granulation.

The other method has proven reliable in all cases that I have operated. The animal is prepared by putting it on a light diet for two days previous to the operation, for the purpose of reducing the abdominal weight. I always use some form of anesthesia. Although chloral hydrate is the agent I generally employ, I find the effect on the animal varies when considering the dose per body weight administered. Frequently to get the desired state of narcosis I employ with it ether and chloroform or ether alone. I have been using the formula containing chloral suggested by Dr. H. E. Bemis, namely, chloral 1 dram, acacia 1 dram, water 1 ounce. With chloral in this dilution I have administered 2 to 4 ounces per 50 pounds body weight per rectum.

We nearly always encounter difficulty in making the animal retain the solution when administered per rectum. I think the action of chloral would be more uniform if it were possible to get a complete retention of the drug. I always employ the maximum dosage suggested in the above formula and inject it high per rectum. I think with a little practice and care, enough of the drug with the dose suggested will be retained to get a satisfactory narcosis. The rectum must first be emptied, otherwise the drug may be expelled. To make the rectal injection I employ a 4-ounce dose syringe equipped with a 9-inch nozzle. The nozzle should be well lubricated to make the insertion easy. When

[1] Presented at the thirty-fourth annual meeting of the Iowa Veterinary Association, Des Moines, Iowa, January 17-19, 1922.

the nozzle has been inserted as far as it will go, a small amount is injected, followed by an attempt to get the nozzle farther on, and this is continued until the proper dose has been administered. After the nozzle has been withdrawn it is usually best to put pressure on the anus for a little while to prevent the animal from expelling the solution. However, if the animal struggles very much it had better be turned loose, as it is more liable to expel the solution through its struggling than when let alone on its feet.

I have found that in twenty minutes the action from the chloral has reached its height. If the narcosis is not satisfactory at that time I administer by inhalation ether and chloroform, or ether alone, depending upon the action from the chloral.

The seat of operation should be well prepared, as this operation should be performed as aseptically as possible to avoid stitch pus and recurrence as a result. After preparing the part to be operated on, I fit a clean cloth provided with a slit over the ventral abdomen and allow the hernial sac to protrude through the slit. This will prevent at least some contamination from the surrounding parts.

TECHNIQUE OF OPERATION

An elliptical incision is made over the fundus of the hernial mass. The isolated island of skin is removed down to the hernial sac. By means of blunt dissection the hernial sac is isolated from the surrounding tissue. This dissection is to be carried on until the neck of the hernial sac is reached, at which point the wall of the sac will be found to be thinner than at the fundus of the sac. The hernial ring is usually elliptical in shape, so to ligate the neck of the hernial sac at this point I have used a hernial clamp and brought the sides of the neck together with a tug stitch. For this purpose I have used a sterilized No. 16 braided silk. After the clamp is removed the hernial sac is cut off about a half inch below the line of suture. The stump is then thoroughly painted with tincture of iodin, especially along the line of suture. There is some tissue in this region, the cutaneous abdominal muscle, which is brought together over the stump and the edges united, using an interrupted stitch set closely in order to get good close apposition. I generally employ a No. 3 catgut

for suturing this layer, so as not to get any irritation from the stitches later.

The purpose of this line of suture is to support the stump of the ligated neck of the hernial sac long enough for it to form a firm plug in the hernial ring, which is what we are working for as we are depending on this plug to retain the intestines and thereby prevent a recurrence of the hernia. An improvement has been suggested by Dr. H. E. Bemis, as follows: Isolate and ligate the hernial sac as before, being sure to obliterate the sac completely, split the fascial sheath which surrounds the *rectus abdominus* muscle, and pull the edges from either side over the median line where they are sutured. This makes a more rigid support to the stump than does the cutaneous muscle, and I feel that this method is to be preferred in cases where it is possible. Lastly, the edges of the skin are united, but before the edges are brought together all surplus skin should be removed, so that when the edges of the skin are brought together the skin will come up snug against the abdomen, which will aid the inner layer in supporting the ligated neck of the hernial sac and the abdominal weight over that region.

If the intestines are adherent to the sac this method must be modified. In that case the hernial sac will have to be opened and the adhesions broken down if possible. In two cases on which I operated I excised the adherent part and performed intestinal anastomosis. This part of the operation was successful, but after a time the suturing at the ring relaxed and I again had a hernia. Had I used ligation of the sac I think it would have prevented the recurrence.

After the completion of the operation the animal is released in clean quarters, and no further treatment is given, except that it is put on a limited diet for a week.

A little post-operative swelling will follow the operation, and this is good, as it assists the cutaneous stitching in supporting the stump long enough for it to form a plug. Should the swelling become too great, drainage will have to be provided, which will, of course, greatly reduce chances of improving the original condition. Frequently the swelling can be reduced by allowing the animal more range for exercising.

In one case I operated on a purebred spotted Poland China boar pig which the owner had received from a breeder as a

gift, as he thought it valueless. The condition was completely reduced by operation, and the animal did so well following that the owner has decided to head his herd with this animal. I discouraged this idea, however, fearing that several of the offspring might become thus affected through heredity. Contrary to my advice, he is making this animal his herd boar, and it will be interesting to see what the results may be.

The reason there were fewer wrecks in the old horse-and-buggy days was because the driver didn't depend wholly on his own intelligence.—*Newark Ledger.*

A financial item says that many Wall Street men are going back to the farm. They ought to be especially proficient when it comes to watering the stock.—*Southern Lumberman.*

THE JOURNAL has been informed that Dr. James A. Waugh, of Pittsburgh, Pa., is a grandfather, a grandson having been born February 23. Grandfather Waugh, who still feels his years lightly, has passed his 66th birthday. THE JOURNAL extends congratulations to Grandfather Waugh.

We are informed that Dr. N. Rechtenwald has retired from active practice at the good old age of 77. THE JOURNAL extends best wishes for many years to enjoy his well earned rest.

Dr. W. E. Dingus, formely in the Army service, is now located at Smallery, Kentucky, where he is veterinarian for the Pivot Rock Coal Company.

Cattlemen in the Chubut district of Argentina have just disposed of about 500,000 3-year-old steers. The average price was about $3.50 U. S. money.

Senior students in the Veterinary Division of the Michigan Agricultural College gained valuable field practice and experience last month when they worked with the Federal tuberculosis squad in Livingston County. Each senior traveled with a Federal inspector, serving as his assistant during the country campaign.

A NEW PARASITE OF THE PIG [1]

By JAMES E. ACKERT *and* FLORENCE KING PAYNE
Agricultural Experiment Station, Kansas State Agricultural College, Manhattan, Kansas

WHILE investigating the relation of the domestic pig to the spread of human hookworm disease (Ackert and Payne, 1922) in Trinidad, British West Indies, the writers discovered in the native pigs a nematode resembling the human hookworm, *Necator americanus*. As the experimental pigs in which the new nematodes were found had been fed large numbers of infective larvae of *N. americanus*, it was first thought that the new worms were similar to this human species. But morphological studies on living and preserved specimens convinced the writers that the pig form represents a new species, for which the name *Necator suillus* has been proposed (loc. cit.).

The new species closely resembles the human *Necator* in body proportions and general appearance, but is distinctly smaller, the males averaging 6.9 mm. in length and the females 9.5 mm. while in *N. americanus* the males average 8.4 mm. in length and the females 11.9 mm. Constant morphological differences between the pig and the human forms also occur in the angles of the ventral plates, shapes of the lateral lancets and lengths of the terminal branches of the dorsal bursal ray.

For the convenience of those making intestinal examinations of pigs a brief description of the new hookworm is here given.

THE GENUS NECATOR, STILES, 1903

Hookworms belonging to this genus have a small mouth capsule, narrowed anteriorly (ventrally) by chitinous plates. On each side of the base of the dorsal cone is a lateral chitinous plate or lancet with a smooth edge (not serrated); ventral lancets present as in *Anchylostoma*. No ridges occurring on outside of ventral wall. Opening of the dorsal esophageal gland on tip of a cone (dorsal tooth) projecting freely into the buccal capsule. Bursa closed. Dorsal ray of bursa divided to its base.

[1] Contribution No. 58 from the Zoology Department, Agricultural Experiment Station, Kansas State Agricultural College. The opportunity to make this investigation was afforded by the International Health Board of the Rockefeller Foundation through the efforts of Dr. William W. Cort, Johns Hopkins University, and Dr. George C. Payne, Trinidad Anchylostomiasis Commission.

Necator suillus, Ackert and Payne, 1922

Specific diagnosis.—With the characters of the genus. Inner edges of ventral plates rounded. Dorsal tooth very short. Lateral lancets broadly wedge-shaped in profile. Ventral lancets rather slender; dagger-shaped in side view; point toward base of dorsal tooth. Esophagus comparatively short and slender.

Male, 5.25 to 8.75 mm. long by 0.09 to 0.246 mm. in thickness; average length, 6.9 mm. Buccal capsule 57 to 75 microns long (dorsoventrally), average 65; by 58 to 77 microns wide, average 68. Bursa funnel-shaped. Dorsal rays short and comparatively stout; terminal branches of dorsal rays long and slender; externodorsal ray short and stout; posterolateral, mediolateral and externolateral rays short and slender; lateroventral and ventroventral rays stout. Spicules 0.423 to 0.471 mm. long and barbed at extremity.

Female, 7.3 to 12.5 mm. long by 0.295 to 0.382 mm. in breadth; average length, 9.5 mm. Buccal capsule 68 to 89 microns long, average 74; by 67 to 94 microns wide, average 75. Vulva near equator of body, but anterior to middle. Eggs 56 to 66 microns long by 35 to 40 microns wide, in early segmentation when deposited; average length, 63 microns; average width, 37 microns.

While *N. americanus* generally occurs in the duodenum, the pig *Necator* is most commonly found in the ileum and jejunum. However, the latter may be found in the duodenum, and, as is well known, the human form may occur in the jejunum and ileum. Judging from the bloody ulcers caused by these worms and from the emaciated appearance of the host pigs containing many worms, *Necator suillus* is of economic importance in Trinidad, B. W. I. Postmortem examinations of pigs from various parts of the island showed that both old and young pigs were infested, some containing several hundred of these hookworms.

After the foregoing observation had been made O'Connor's report (1920) of finding *Anchylostoma* in pigs was received. Working at Funafuti, Ellice Islands, O'Connor took from the small intestine of a pig thirty hookworms which resembled *A. duodenale,* except for size, being somewhat smaller than this human hookworm. Recently hookworms identified as *Anchylostoma duodenale* were reported from semi-domesticated pigs in North Queensland by Legg and Rheuben (1921).

While a large number of hookworms have been taken from

pigs in Trinidad, none of those examined microscopically belong to the genus *Anchylostoma*. The rather high percentage of infestations indicates that *N. suillus* has been prevalent in Trinidad for some time. However, failure to find these hookworms heretofore can readily be explained by the ease of overlooking them both in the intestinal contents and in the mucus on the intestinal walls.

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Topeka Daily Capital reports that officials of the Russian government are purchasing horses by the thousands in Kansas, Colorado, and Wyoming, and includes: "They are negotiating to have these horses slaughtered and the meat canned and shipped to Russia in train-load lots."

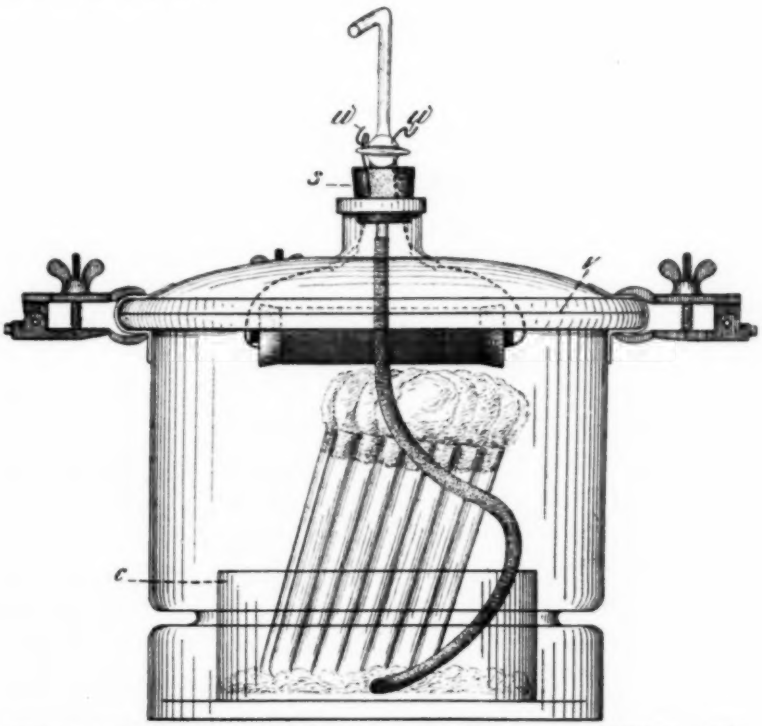
Dr. E. A. Watson, Pathologist for the Canadian Health of Animals Branch, returned to Ottawa on December 5 from duty in Europe in connection with the reindeer industry and the Hudson's Bay Company's importation of reindeer to Baffins Island. While in Norway visits were made to the Government Veterinary Institute in Christiania, comprising a block of fine buildings just erected and equipped for the study of animal diseases. At Cambridge, England, a visit was made to the new Institute for Parasitological Research which has been completed and opened. It is under the direction of Prof. G. H. F. Nuttall, and will no doubt become a great center for research in parasitology. The old laboratory known as the Quick Laboratory had attained an international reputation. Canadian veterinary research workers have always been very kindly received there and should not lose an opportunity of visiting the new institution.

NOTE ON THE BROWN ANAEROBE JAR

By WILLIAM N. BERG

Pathological Division, Bureau of Animal Industry, Washington, D. C.

THE USEFULNESS of the Brown anaerobe jar may be further increased if a vacuum desiccator of the Frühling and Schultz type be substituted for the museum jar originally described.[1] A very satisfactory Brown jar was constructed with such a desiccator, inside diameter 200 mm., inside height 220 mm. Larger ones, or desiccators of heat-resistant glass, could undoubtedly be used. The advantages are: (1) The lid is quickly and effectively sealed to the jar with vaseline. (2) The joints are easily kept tight. (3) More space is available for cultures. (See illustration.)



Brown anaerobe jar with vacuum desiccator. C, crystallizing dish; S, rubber stopper; V, vaseline seal between ground-glass rims; W, copper wire.

[1] Brown, J. H. An improved anaerobe jar. Jour. Exp. Med., 1921, vol. 33, p. 677.

Attaching the coil to the lid.—The glass stopcock is removed from the lid of the vacuum desiccator and replaced with a well-fitting rubber stopper (*s*) carrying a glass inlet tube for hydrogen. Two heavy copper wires (*w*), each 1.7 mm. in diameter and approximately 200 mm. long, are pushed directly through the stopper. These support the coil and carry the current. The attachment to the nichrome wire and the construction of the coil are made as described by Brown, using palladium asbestos. The larger diameter of the desiccator made it possible to construct a longer coil. The joints between the lid and the stopper, around the tube and wires, etc., are easily sealed with shellac dissolved in alcohol.

To operate.—A large glass crystallizing dish (*c*) carrying the cultures to be incubated is placed inside the desiccator. The porcelain plate is removed in order to utilize the full height of the jar. The dish is used to prevent contact between the cotton plugs and the moist sides of the jar. With the fingers vaseline is rubbed on the clean, dry ground-glass rim of the lid and of the desiccator jar. There is little danger of using too much. The lid is put on, pressed down lightly, with rotary motion to press visible air bubbles out of the seal (*v*). With a little practice, taking the lid off, replacing the cultures and again sealing the jar takes but a few minutes. When the rim has the appearance of a smooth, uniform layer of vaseline between two glass surfaces there will be no leakage. The lid is clamped to the desiccator jar with three small buret clamps.

The coil is connected with the current for about one minute, then disconnected. A 220-volt electric-light current, reduced by passage through four 120-watt carbon filament lamps in parallel, is used. This heats the coil so that it is hot to the hand. Heating to redness or for a longer period is not necessary. A towel wet with cold water is placed on the lid. Hydrogen from a Kipp generator is passed through a wash bottle containing 5 per cent silver nitrate solution into the desiccator at the rate of about two bubbles per second. Generally hydrogen enters for about 10 minutes and stops because the combustion is slow and the apparatus filled. The apparatus is allowed to stand without any change; presently, as the combustion proceeds, more hydrogen enters, slowly at first, but with increasing rapidity, until it becomes advisable to cut down the gas to two bubbles per

second. An hour is required for complete combustion and filling with hydrogen, during which time the apparatus requires only occasional attention. When hydrogen ceases to enter the apparatus a second time it is disconnected. Obligate anaerobes do, and obligate aerobes do not grow in the jar described.

FERNDALE DECIDES ON MOUNTED POLICE

Ferndale, Mich., will graduate from the small town class by establishing a mounted police force instead of its present system of patrolling with small motor cars, which the commission finds both costly and ineffective, particularly when it is desired to detour over unpaved roads.

The commissioners estimate that one mounted officer can do an equal amount of work performed by a single small car and at materially less cost.—From *Detroit Free Press.*

TO LADY SLIPPER

By N. S. MAYO

Long years have passed by, yet still in my dreams,
Your picture shines bright and your black coat still gleams.
I'll slip on the saddle and tighten the girth,
While you tug at the bit and paw at the earth.

A swing to the saddle, there's a faint squeak of leather.
We are off, you and I, for a fine time together.
A fox-trot so smooth, a canter or run,
All cares are forgotten—the world is still young.

You'll fly through the meadow, not feeling the load,
And trot through the woods, on the Old River Road.
The fence by the spring you'll clear at a bound.
Tell me where on this earth there's more joy to be found!

You have gone years ago to green pastures so free,
And there, at my passing, you'll be waiting for me.
Once more in the saddle, we'll go on together,
As we did long ago in fair or foul weather.

A PROPOSED PLAN FOR THE REORGANIZATION OF THE AMERICAN VETERINARY MEDICAL ASSOCIATION [1]

By A. N. CARROLL, *Pueblo, Colorado.*

THE American Veterinary Medical Association, the greatest association of veterinarians in the world, is failing in the principles for which it exists. Not failing because it has not been the instigator of most of our advancement, for it has and will continue as such, but failing in that with its present membership and organization it is hampered and is but a part of what it could and should be. Failing because it lacks the ability to convince the rank and file of veterinarians that it is of inestimable value to them, in fact their greatest asset. Failing because it lacks numerical, enthusiastic support of the veterinarians and necessarily the public. Failing in that it is not sufficiently democratic. How is this condition to be corrected so that the Association will assume the position which rightfully belongs to it, becomes the paramount issue.

The development and maintenance of potent organizations is one of the necessities of the times. All big, successful enterprises and professions advance on that principle. But without loyal support of the constituents any concern, no matter what its initial strength, must weaken and fail unless cooperation is accomplished. Efficiency and power are the product of this cooperation. The average man is reluctant about conceding its advantages. An example of this has been the failure of farmers in uniting their energies, allowing all other branches of trade to become strong through organization, until during the present reconstruction they suffered such overwhelming losses. Necessity forced them to band together with the help of the county agents, and the fruits of the endeavor are unlimited. Through their Federation of Farm Bureaus, founded on the sound principle of representation, built from the bottom up, from the county societies to the State association and finally the national, they are now controlling the policies, through the Farm Bloc, of a yielding though not always complacent Congress.

[1] Presented at the nineteenth annual meeting of the Colorado Veterinary Medical Association, Denver, January 19, 1922. A resolution was passed approving the plan and a committee was appointed to enlarge the idea into a better working basis.

We, like they, must build from a more solid foundation, develop one organization and one only, with one purpose and one result. We are too strong to speak of failure in the true sense of the word; but admitting our failings, it remains for us all to strengthen our Association into one large body, democratic, powerful, progressive.

I do not wish to criticise the past or present management of the A. V. M. A. or State associations. They have erred, it is true, but more in the fact of omission than commission; more in lack of numerical strength than in desire or ability. Considering the half-hearted support received from the profession as a whole, the accomplishments have been many.

I wish to offer a plan broader in its scope, more democratic in its administration and greater in its possibilities. I submit for consideration the following tentative outline, already approved by many and at present being considered by a special committee:

Commence at the bottom; create there the spirit of your organization in the minds of the individual. Champion his cause; attain his interest and keep it aroused; take a hand in his problems; dispel the spirit of competition; develop the business side as well as the professional. The prosperous man is the contented man, not contented by any means with his present accomplishments, but contented with his profession and its future. It all rests with the individual, regardless of his position. Look well to his development. Band him with his fellow workers into small groups with local interest, join the groups into State societies, making them 100 per cent in membership, loyalty and push. From this solid foundation organize the State societies into the national or continental association, still maintaining all of the power of the constituents but strong with the incentive of cooperation.

It is proposed that there be devolped as many county or district groups, to be known as component societies, as is possible, by an active campaign through publicity, resident secretaries and individual activity, and that these component societies each elect two delegates and alternatives for each twenty-five members or fraction thereof, these delegates to form the House of Delegates of the State association and transact all of the business of the latter and in policy to conform to the House of Representatives as hereinafter provided.

The House of Delegates of each State, Territorial or Provincial society, to be known as constituent associations, to elect two delegates and alternates for each 100 members or fraction thereof, to form the House of Representatives of the A. V. M. A., similar to the House of Delegates in the constituent societies, which is vested with all legislative power of the continental body. The Bureau of Animal Industry and Army, as well as each scientific section, to be entitled to two delegates each. All dues shall be collected by the component or constituent association and proportioned to the various treasuries as later determined.

The general officers of the A. V. M. A.—President, Vice-President, Speaker, Secretary and Trustees—shall be elected annually by the House of Representatives, except the Board of nine Trustees, three of whom shall be elected annually to serve a period of three years and as far as possible represent the different sections of the country. The Board of Trustees to elect the National Treasurer, who shall be responsible to them as custodian of all moneys and have the approval of the Board in all expenditures. The President, to be elected from members outside of the House of Representatives, will preside at the annual meetings. He may appear before the House or Trustees and make suggestions and nominate members of all standing committees unless otherwise provided, they to be elected by the House. The Speaker shall be presiding officer of the House of Representatives. He may appoint special committees. The Secretary shall act as General Secretary to the A. V. M. A. as well as Secretary to the House of Representatives.

The Board of Trustees shall superintend the publication of the JOURNAL, shall appoint a General Manager and Editor, such assistants as necessary, and determine their salaries, condition of employment and general policy. During the intervals between the regular sessions of the House of Representatives the Board of Trustees shall supervise action of regular committees and may appoint emergency committees.

The annual meeting shall be known as the scientific assembly, a convocation of all members for the presentation and discussion of subjects pertaining to the science and art of veterinary medicine. This assembly shall be divided into as many sections covering separate branches of the profession as may be determined necessary by the House of Representatives.

This general plan is known as a federacy where the component and constituent societies are to be entirely self-governing in all local matters but shall conform to the Constitution and By-Laws of the A. V. M. A. and be directed by it in matters of general policy.

The above outline will give a numerically strong and loyal foundation, create representation from every section, confine the business of the meetings to the hands of a few well-chosen delegates, assuring mature deliberation, developing the weaker points without hampering the stronger, eliminate sectional and factional discord, in fact initiate the soundest form of organization. In this way and this way only, by systematic cooperation, can we keep pace with this, the Progressive Age.

The Colorado State Board of Livestock Inspection Commissioners has decided to add its influence in favor of the horses as against the tractor. Draft teams, it was pointed out, are the need of the hour on the farm and American horse breeders can gain considerable encouragement by the movement now fostered by the American Horse Association.—*Denver Daily Record Stockman.*

CLINICAL AND CASE REPORTS

(Practitioners and others are invited to contribute to this department reports of unusual and interesting cases which may be helpful to others in the profession.)

COMPLETE FRACTURE OF THE JAW IN A HOG [1]

By H. L. McMillan,

Estherville, Iowa

THE PATIENT was a 400-pound boar about a year old. The owner turned this one and another out in adjoining exercise lots, and they got to running up and down the woven fence, making slashes at each other with their tusks. Before the owner could get them back into their pens one had caught his tusk in the fence and completely torn loose a portion of the mandible. It broke off just posterior to the socket of the tusk and completely split in the median line, anteriorly. It was considered very doubtful as to the outcome of any sort of treatment, but as the animal was highly valued and there was everything to gain and nothing to lose it was decided to try suturing the broken ends.

As only the owner and myself were present, the operative technic was necessarily very simple. After complete chloroform anesthesia was obtained, the mouth was forced open. The mucous membrane and submucosa were dissected off down to the periosteum on the internal and external surfaces of both fractures. Small holes approximately one-sixteenth of an inch in diameter were drilled through the bones three-quarters of an inch from the broken edges. Then two interrupted sutures were formed at each end of the loose piece of bone, using doubled coarse silver wire. The greatest trouble encountered was twisting off the silver wire before sufficient tension was applied. For this reason I would use copper or some other wire in a similar operation.

The wounds were carefully washed and swabbed out and received no further attention. The animal was kept on slops and soft feed for two weeks. After the first day he did not miss a feed. There was moderate swelling for the first week. At present callous formations the size of the little finger can be felt on

[1] Presented at the thirty-fourth annual meeting of the Iowa Veterinary Association, Des Moines, Iowa, January 17-19, 1922.

either end of the break, but his teeth are perfectly lined up and even the tusk is in its proper position.

ACRIFLAVINE IN OPEN JOINTS[1]

By H. L. MCMILLAN
Estherville, Iowa

A PRELIMINARY REPORT is made on the use of acriflavine solution in the treatment of open joints in the horse.

Case 1 was a driving type pony which was kicked on the external surface of the leg and the calk perforated the lower pouch of the femoro-tibial joint capsule. When I saw her three days after the accident she would not touch the foot to the ground. There was considerable swelling and pain over the entire region of the joint; she was off feed and gaunted up badly. I advised the owner to bathe the leg well with hot water and left him a syringe, with instructions to inject a small amount of 1-1,000 acriflavine solution three times daily, and if she was no better in a few days to put her out of misery. My main reason for using the acriflavine in this case, I must admit, was its cheapness. What was my surprise when he returned the syringe in ten days and said he was using her as she was completely recovered and the wound practically healed.

Case 2 was a runaway accident in which the horse kicked a sharp bolt on the buggy which cut down through the posterior annular ligament, exposing the flexor tendons; so this was an open tendon sheath, and not a joint. This case was treated soon after the accident. After trimming the wound a pack was applied wet with 1-1,000 acriflavine solution. This pack was changed twice daily at first, later once daily, and finally once every two or three days. There was no pus formation and very little swelling, so it made an uneventful healing in two weeks.

Case 3 was a twelve-year-old mare which got a bad wire cut across the front of the hock joint. She was neglected for a week and when first seen was off feed, gaunted up badly and would not put the foot to the ground. The entire joint region and leg were badly swollen; temperature 104°F. There was a free discharge of synovia mixed with pus. Treatment consisted in bathing the leg with hot water twice daily and injecting a small

[1] Presented at the thirty-fourth annual meeting of the Iowa Veterinary Association, Des Moines, Iowa, January 17-19, 1922.

amount of 1-1,000 acriflavine solution as deeply as possible into the joint capsule. Two days later the joint ruptured on the postero-internal surface. However, it was not possible to inject from one opening to the other, so both were treated. In three weeks the swelling had practically gone, both wounds completely closed and all discharge ceased. She was turned in pasture every nice day and played with her mate as usual, but to this day she will not use that leg, although the joint is perfectly mobile, no local pain on pressure, and apparently normal in every way except the slight enlargement.

Case 4 was a puncture wound in the postero-external portion of the hock joint, which became very badly infected before it was found. The leg was swollen from above the hock to the foot, the animal lying down practically all the time, but would eat and drink when feed and water were brought to him. After a thorough cleansing, a large pack wet with 1-1,000 acriflavine solution was applied and kept moist for thirty-six hours. Thereafter a small amount of this solution was injected twice daily for a week, then once daily. This joint also ruptured on the inside after a few days. Now, after five weeks, the swelling has gone down pretty well and the discharge has practically ceased. The horse is picking up in condition and handles himself quite well, so it looks as if he will make an uneventful recovery.

These are all the cases on which I have had a chance to try out this line of treatment. They are not, of course, enough from which to form definite conclusions as to its real value. However, as may be seen from these few cases reported, the recoveries and amount of treatment necessary have been above the average for this class of cases. I hope that some will take sufficient interest to give this line of treatment a fair trial, so that we can learn good or bad points that may be brought out at some future meeting for the good of all.

ACRIFLAVINE AND PROFLAVINE [1]

By N. S. MAYO, *Chicago, Ill.*

IN the *British Medical Journal* of October 29, 1921, C. H. Browning, M. D., D. P. H., Professor of Bacteriology, University of Glasgow, and J. B. Cohen, F. R. S., Professor of Organic

[1] Read before the Chicago Veterinary Association.

Chemistry, University of Leeds, have an excellent article on "The Chemotherapy of Pyogenic Infections with Special Reference to the Antiseptic Properties of Acridine Compounds." The following excerpts are taken from this article:

Under the conditions of the test the sterilizing concentration of acriflavine as determined by the modal value obtained in an extensive series of experiments is for *Staphylococcus aureus*, in peptone water 1 to 100,000, in serum 1 to 200,000; for *B. coli*, in peptone water 1 to 20,000, in serum 1 in 100,000. The striking result therefore appears that this substance is not reduced in its antiseptic power by serum.

Proflavine was found to be practically indistinguishable from acriflavine in antiseptic action.

In rabbits it is possible by means of intravenous injections of proflavine, which do not affect the health of the animal, to render the serum bactericidal for several hours when tested in vitro with *Staphylococcus aureus* and *B. coli*.

Doses of 0.33 gram of proflavine sulphate in physiological saline have been given intravenously at this rate to adult subjects without untoward effects beyond transient sickness. The skin becomes stained of a yellow tint, which, however, completely disappears in the course of twenty-four to forty-eight hours. The dye is excreted by the kidneys, and, as estimated from the absorption spectra by Dr. S. Russ, fully a third of the amount administered can be accounted for in the urine passed during the subsequent two days. There is also excretion of the substance by the bile in the monkey.

Thus, it is a fact that large wounds may be treated with acriflavine solution (1 in 1,000) for weeks without disturbance in the development of granulation tissue or interference with epithelial ingrowth.

To summarize the results relating to antiseptic powder and toxicity, it may be said that the diamino-acridine compounds possess much more powerful bacteriostatic and bactericidal action in comparison with their toxicity for mamalian tissues than any other substances hitherto investigated. In addition, they are stable, and do not become inactive though undergoing chemical changes in the tissues. These, and certain other compounds referred to later, are the only powerful antiseptics which are not reduced in their activity by protein solutions such as serum.

CASE REPORT

From the above it will be noted that proflavine is equally efficient as an antiseptic as acriflavine. This is important to veterinarians, because proflavine is cheaper. It is not as readily soluble as the acriflavine, but solutions of proflavine 1 to 300 can be readily made.

The dosages of the flavines for intravenous injection that have been recommended are for sheep and swine 50 mils of a 1 to 1,000 solution, and for horses and cattle 150 mils.

On March 7 an aged gray mare, weighing about 1,000 pounds, was given 650 mils (c.c.) of a 1 to 1,000 solution of proflavine in physiologic saline. The proflavine solution was administered

by gravity through a No. 16 hypodermic needle thrust into the jugular. The solution was warmed to approximately body temperature, and the time required to administer this amount of the proflavine solution was ten minutes.

No untoward symptoms were noted except a very slight salivation, probably due to slight nausea, the result of the intravenous injection.

On March 9 the same animal was given 705 c.c. of a 1 to 300 solution of proflavine in physiologic saline. The time required for its introduction by gravity, through a No. 16 hypodermic needle thrust into the jugular, was five minutes. This amount of solution contains 2.35 grams of proflavine.

After a few minutes following the introduction of the solution there was slight salivation, as in the previous instance. In about twenty minutes the visible mucous membranes showed a decidedly yellow tint that increased later to a very marked yellow color. The urine also became so yellow that the hind legs were stained yellow by it. No ill effects other than a slight salivation were noted.

It will be seen that it is possible to give very large doses of proflavine intravenously without serious disturbance of the animal's economy. As the flavines seem to be particularly efficient as antiseptics against the cocci group of organisms, proflavine may prove to be very valuable as a treatment of systemic infections of organisms of the cocci group.

FOREIGN BODY BETWEEN TEETH OF HORSE

AT A RECENT MEETING of the Chicago Veterinary Society Dr. John Jaffrey reported an interesting case of a horse that was brought to Jaffrey Brothers' hospital showing symptoms of salivation with a champing of the jaws.

An examination with an electric light showed a piece of a limb of a tree, about three-fourths of an inch in diameter, firmly wedged between the upper molars. Considerable force was required to dislodge it. There was a necrosed area about the size of a dollar at one side of the tongue, and also a small area on the roof of the mouth.

The owner reported that another veterinarian had examined this horse six days previously and had given the owner a box of ointment to rub on the outside of the horse's throat.

ABSTRACTS

REPORT ISSUED TO THE MINISTER OF AGRICULTURE, COMMERCE AND TRADE OF HOLLAND, BY THE HEAD OF A COMMISSION APPOINTED TO INVESTIGATE MATTERS CONCERNING FOOT-AND-MOUTH DISEASE. L. de Blieck and A. J. Winkle. Bijlage VII, August 20, 1919, Utrecht.

The investigations of the Commission were divided into three sections.

1. Testing the immunizing properties of blood from cattle which had recovered from foot-and-mouth disease when injected into susceptible animals in herds in which the disease had just made its appearance.

As many fatalities occur among young calves during the progress of the disease in herds in which the calves were kept, the main attention of the Commission was directed to the protection of this class of animals. It was found that test calves could be protected from an injection of 1/3 c.c. of fresh virulent serum if injected subcutaneously with 150 c.c. of blood serum from a cow that had survived an attack of foot-and-mouth disease for four or five weeks. The immunizing injections were given simultaneously with the virus, or within eight hours of such injection.

2. Investigation of the effects of "trypaflavine."

"Trypaflavine" is a salt derived from a group of acridin dye stuffs, which had been previously found effective in protecting mice against inoculations with nagana by Loeffler and Benda.

The conclusions of the Commission were that "Trypaflavine" as now placed upon the market has no value in the control or suppression of foot-and-mouth disease.

3. A few tests of the virulence of various products of foot-and-mouth lesions and of means of producing active immunization.

The virulence of lymph for cattle was found to be very marked in all tests. 1/350th of a c.c. injected intravenously invariably produced characteristic symptoms of the disease in yearling cattle in one to three days. The writers found that blood from animals affected with foot-and-mouth disease varied greatly in virulence. Red blood corpuscles that had been subjected to

washing twelve times in succession remained virulent and required more time in which to produce the disease than fresh blood of the same drawing.

Attempts to devise a reliable method of immunizing cattle against foot-and-mouth disease failed. One calf and one pig failed to develop the disease when given the final test injection, but most of the test animals showed fever and developed vesicles within six days.

They obtained fresh serum in May, 1919, stored it under paraffin oil, and tested its virulence at intervals until January, 1920. Although considerably weakened at the latest trial, a single passage through a calf was sufficient to give it its full original power again. H. J. WASHBURN.

THE ACTIVE IMMUNIZATION OF HORSES AGAINST TETANUS. J. B. Buxton. Vet. Jour., vol. 77 (1921), no. 12, p. 445.

The production of active immunity against diphtheria as a result of injections with more or less neutralized mixtures of diphtheria toxin and antitoxin has been definitely established.

To determine whether such a procedure would result in the production of an active immunity against tetanus, the author and his colleagues treated several horses with neutral mixtures of tetanus toxin and antitoxin. After an interval of several weeks the horses withstood an intramuscular injection of sterile garden soil together with 2 c.c. of an actively growing culture of the tetanus bacillus representing many fatal doses.

The author states that the expectation that active immunity will be produced by the injection of tetanus toxin and antitoxin is justified by experiment. H. W. SCHOENING

RECOVERY FROM FISTULA IN THE CECUM OF THE HORSE. L. Pelka. Monatshefte für praktische Tierheilkunde, vol. 32 (1921), p. 399.

Case I. Horse with wound, 3 inches long and an inch wide, on the right side, about an inch from the linea alba, immediately behind the last rib. Probably a barbed wire cut 8 to 10 days before. The author washed the wound with 3 per cent lysol solution. In the next few days there was local swelling with dis-

charge of food masses from the opening. From the direction of the irrigation tube and palpation with the finger, diagnosis of fistula of the cecum at the apex was made. Treatment. The horse was put on half rations. Two liters of 1 per cent lysol solution were infused into the cecum. Edges of wound were daily treated with 1 to 10 solution of zinc chloride, covered with heavy layers of cotton and a truss applied. This was a heavy leather plate, 20 inches long, 16 inches wide, provided with suitable belts and buckles to keep it tightly in place. An opening 3 by 2 inches was cut in the truss over the wound, to permit free discharge from the fistula. There were adhesions between the edges of the wound in the cecum with those in the abdominal wall, but there was no union by scar tissue. In the next eight days there was local necrosis and pieces of abdominal muscle sloughed off; the opening having become larger, the truss was taken off. The opening of the truss was closed with a wooden plate carrying a heavy pad of corrosive sublimate cotton. After irrigating the cecum and cauterizing the wound with zinc chloride, the truss was put on so that the pad sat snugly over the fistula. At first the pad was changed four times daily, later, twice daily. The wounds became smaller daily and recovery followed in three weeks, leaving a small hernia. The horse was still at work a year and a half afterwards, the hernia producing no ill effects.

Case II. A two-year colt tried to jump a fence; a projecting nail inflicted a wound in the abdominal region from which food came out. Wound was seven inches long by one inch wide, running straight backward from a point an inch on the right side of the median line close to the insertion of the fifth rib. The author washed the wound with lukewarm 1 per cent cresol solution. A rubber tube could be introduced 15 inches through the opening toward the right hip. Diagnosis: Penetrating wound of abdominal wall and cecum. Treatment: Edges of wound were cauterized with zinc chloride solution. As a precautionary measure, a fenestrated truss was applied. It was feared that the adhesion of the intestinal wall to the peritoneum was not firm, and that the pressure of intestinal contents, with a closed bandage might disrupt the union, with generalized infection resulting. Ten days later the colt was making a good recovery, with only a slight discharge. In view of the previous

experience, a similar truss was put on, provided with a sublimate-cotton pad an inch high, changed twice daily. Complete healing of fistula occurred in three weeks. A pigeon egg sized hernia was all that was visible a half year later. There was no fever in either case. W. N. BERG.

BOVINE TUBERCULOSIS. E. H. R. Harris and R. S. Williams, Jour. Hyg., vol. 20 (1921), p. 132. (Abs. in Amer. Rev. Tubere., vol. 6 (1922), p. 15.)

The material forming the basis of this report was derived from a central clinic in a large industrial county borough and from a series of smaller clinics. The total population of the area exceeds 200,000. The cases analyzed were drawn from records of 4,000 individuals examined. Approximately 50 per cent of these were diagnosed as suffering from tuberculosis; about 10 per cent or 400 persons showed evidence of nonpulmonary tuberculosis. Of these, tuberculous cervical adenitis was the predominant type. Of 331 cases, 217, or 65.5 per cent, gave no history of tuberculosis in the family; 86, or 25.9 per cent, gave a history of tuberculosis in near relations, and 28, or 8.4 per cent, in more remote relations. The possibility of family contact in the two large groups of glandular and bone and joint cases are very similar. Of the 250 cases of open pulmonary tuberculosis there was no family history in 126, family history in a near relative in 105 and in a remote relative in 19; constituting 24.2 per cent for glands of the external group, 26.7 per cent for joints, and 25.9 per cent for the 331 cases of other "tuberculous disease." The figures given suggest that the family histories of cases of tuberculosis, if taken in sufficient number, would constitute valuable collateral evidence of the extent of bovine infection. The lower the figure of positive family history in a near relative, the more likely are the lesions to be of bovine origin. More investigations by tuberculosis officers into the family histories of cases of tuberculosis might prove of great value in indicating the probable extent of bovine tuberculosis in the districts with which the officers are concerned, the extent to which it may vary in one district compared with another, and the relative proportions of cases of human and bovine tuberculosis found in districts of different types, as, for instance, in purely indus-

trial compared with purely agricultural regions. This paper makes it clear that contact infection is not so common in cases of "other tuberculous disease" as in pulmonary infections. There must, therefore, be some other factor at work in these cases.

TUBERCULOSIS ANTIGENS IN MILK OF TUBERCULOUS COWS. B. Epstein. Jahrb. f. Kinderhk., vol. xcv (1921), p. 64. (Abs. in Amer. Rev. of Tubere., vol. vi (1922), p. 16).

Intracutaneous injections of milk from tuberculous cows were made in children having positive tuberculin reactions and showing clinical evidences of tuberculosis. The test was performed with 0.1 c.c. of milk, and the result observed in 24-48 hours, as in the intracutaneous tuberculin reaction. Of 35 injections with milk from tuberculous cows (26 of which had pulmonary tuberculosis and 9 positive tuberculin tests but no clinical tuberculosis), 18 positive and 3 doubtful reactions were noted. Of 13 injections with milk from apparently sound cows (no tuberculin tests), 4 were positive. In 10 instances, milk from cows with negative tuberculin tests was injected, no positive results being observed. Three injections of a preparation of dried milk were also negative. Moreover, milk of tuberculous cows which gave positive intracutaneous tests in tuberculous children, failed to give a reaction in children with a negative Pirquet test. Positive milk reactions caused a flaring up of old or mild Pirquet tests, although milk from sound cows was without effect in this regard. On the basis of these experiments, it is concluded that the milk of tuberculous cows frequently contains tuberculosis antigens which are not present in the milk of nontuberculous cows. The fact may be of some importance in future studies on immunotherapy.

THE SIGNIFICANCE OF THE BACILLI CARRIER WITH REGARD TO THE SPREAD OF FOWL CHOLERA. R. Manninger. Allatorvosi Lapok, 1921, p. 3. (Abst. in Deut. Tierärzt. Wchnschr., 1921, p. 537).

In accounting for outbreaks of fowl cholera on farms where the introduction of the infection from outside sources could be definitely excluded, it has generally been accepted that the fowl

cholera germ exists in saprophytic form in the ground, in pools, and in the digestive tract of healthy birds, and occasionally causes infection when the animals are in a state of lowered resistance. This view is not supported by adequate observations. The results of the experiments of Hertel and Müller, in which birds were artificially infected with fowl cholera bacilli, but did not actually sicken yet did pass virulent organisms in the urine for months, would argue against the correctness of the above view and tend to point to bacilli carriers as a factor in spontaneous outbreaks. The author reports an observation on a hen which could be considered a bacilli carrier under natural conditions. After the outbreak of fowl cholera on a well isolated farm following the introduction of the virus from without, the disease was promptly checked after vaccination with fowl cholera vaccine and disinfection. After a lapse of half a year, a spontaneous outbreak occurred which could be associated with a hen affected with a chronic periarticular inflammation. There was found in the region of the diseased joint an old encapsulated abscess with highly virulent fowl cholera bacilli. The origin of this lesion could be connected with the first outbreak of the disease. From time to time the cholera bacilli might have gained entrance to the blood stream of the affected animal and be excreted through the kidneys. L. T. GILTNER.

AGGLUTININ FORMATION AFTER INTRAVENOUS INJECTION OF VACCINES AND THE INFLUENCE OF NONSPECIFIC PROTEIN TITER. A. Hofmann. Ztschr. Hyg. u. Infektionskrank., vol. 93 (1921), p. 18.

The statement that specific agglutinins can be made to appear in the blood stream by nonspecific protein injections, is disputed, especially in the work of Weichardt and Schrader. The pitfalls in comparative studies in agglutinin formation are pointed out. In careful studies on the rate of specific agglutinin formation after intravenous injection in rabbits of dead *B. coli* and *B. paratyphosus B*, there is noted a latent period of about two days in which agglutinins do not appear. On the fourth or fifth day the agglutinin formation takes place all at once; i.e., there is not the gradual rise observed by certain workers. The flood of agglutinins does not subside for weeks and even months,

and tends to remain at the high level reached about the fifth day. According to Hofmann, the agglutinin titer does not show the gradual rise and fall frequently described. It does show a short latent period, an explosive agglutinin formation taking but a day or two, followed by high agglutinin level. In 23 experiments in which rabbits were injected with deuteroalbumose, sodium nucleinate, and a few milk preparations, a rise in a specific agglutination titer against *B. typhosus* was not found. There is no doubt that good results are being obtained in the protein therapy; the theory underlying the treatment, however, is questioned. Progress will be hastened when a correct theory of the action is obtained. W. N. BERG.

INFECTIOUSNESS OF BOVINE TUBERCLE BACILLUS DURING THE WAR. F. Schaeffer. Ztschr. f. Tuberk., Vol. xxxii (1920), p. 193. (Abs. in Amer. Rev. of Tuberc., vol. vi (1922), p. 6).

There is no question but that the tuberculosis mortality in Germany during the war increased greatly. Whether morbidity increased has not, as yet, been adequately shown. In order to determine this three avenues of approach were used: 1. Autopsies and clinical studies on man. 2. Autopsies and clinical studies on cattle. 3. Observations of the hygienic milk regulations during the war. 1. *Autopsies and clinical determinations on man:* The available data point to an increase in the incidence of abdominal tuberculosis, but the number of cases examined is not considered sufficient to warrant any definite conclusions on this point. 2. *In cattle slaughtered and examined routinely for tuberculosis* the percentage was found to be less during the war than before, so that the chances for an increase in tuberculosis from this source should not be expected. These statistics were based upon killings in Prussia and throughout Germany mounting into many millions of animals. 3. *Hygienic milk regulations:* Although milk regulations were lax during the war, there was no demonstrable increase in the tuberculosis caused by ingestion. This is accountable to the wholesale slaughter of cattle for war demands, with even more than usually rigid government rejection of all tuberculous carcasses. More chance for infections arose in the consumer's household, where the recommendation to cook raw milk for a short time was probably not

heeded because of the scarcity of fuel and the increased amount of work falling upon mothers during the war.

GOVERNMENT CONTROL OF BOVINE TUBERCULOSIS IN GERMANY. H. Haupt. Ztschr. f. Tuberk., vol. xxxiv (1921), p. 43. (Abs. in Amer. Rev. of Tubere., vol. vi (1922), p. 2).

Manifest tuberculosis of cattle includes advanced pulmonary tuberculosis, or tuberculosis of the udder, uterus or intestines. This is reportable to the official veterinarian, who institutes proper measures which may consist in slaughtering condemned animals. *Disposition of milk:* Milk from such animals must not be used, or sold or given away unless heated to a certain temperature and for a certain time. Milk from animals with diseased udders must not, even after heating, be used for human consumption. *Suspects:* Suspected cattle must be isolated in special stalls and be marked; if they are suspected of tuberculosis of the udder the milk must be heated properly before being disposed of. The prophylatic procedure with animals with manifest tuberculosis or animals that are probably tuberculous is to brand them. Rules for their isolation, for the use they may be put to, and the method of slaughtering are contained in the original law and are controlled by the government. This leaves the killing of evidently tuberculous cattle, except those with tuberculous udders, to the decision of the owner. *Routine of inspection:* The official veterinarian examines the animal, if it is suspected or has pulmonary tuberculosis, by making proper tests and sending specimens to the laboratory for bacteriological diagnosis. He issues orders concerning isolation, labeling, and disposal of the animals, warns the owner of the dangers of the milk and informs him of voluntary measures of tuberculosis control. If tubercle bacilli be found, the presence of tuberculosis is established; and the official can order the animal to be killed (with tuberculous udders) or be otherwise disposed of (by the owner). If no tubercle bacilli are found, isolation is then revoked. The clinical picture of tuberculous animals is described as follows: Dull appearance, tight hide, rough hair and palpable lymph nodes were found in 50 per cent. Cough (spontaneous or after moving about) was present in 55 per cent of cases with open tuberculosis, in 15.6 per cent of closed, in 6.9 per cent of

cases of nontuberculous nature and in 22.5 per cent of healthy animals. Rales are the most important symptoms of pulmonary tuberculosis in cattle. The voluntary disposition of tuberculous cattle by the owner does not prove satisfactory.

NEUROTROPIC AFFINITY AND PURIFICATION OF VACCINE VIRUS. C. Levaditi and S. Nicolau. Compt. Rend Acad. Sci., vol. 173 (1921), p. 870.

After two testicular passages in rabbits of the vaccine virus (such as is used for human vaccination) the authors succeeded in infecting a rabbit by intracerebral inoculation, and later they were able to make more than 50 cerebral passages in rabbits. The inoculations were made in the same manner as for passage of fixed rabies virus. A dose of 0.2 c.c. cerebral emulsion was used; the rabbits died in from 4 to 6 days, sometimes in 24 hours, with symptoms of paresis. The animals allow the head to droop, they move about very little, and remain in whatever position they are placed in. The cerebral vaccine retains intact or even to a greater degree its properties for attacking the cornea, skin, and testicles. It is virulent when inoculated intravenously in a rabbit which shows a beautiful generalized vaccine rash after 3 or 4 days. This generalized condition is often fatal, while with the cutaneous and ocular vaccination this is not always the case. Most of the rabbits inoculated on the cornea or in the skin survive; those which die show the virus in the brain.

The cerebral virus can be obtained in an absolutely pure condition, and it is endowed with remarkable vaccinal properties. It can be preserved perfectly in glycerine, and the brain which contains the virus lends itself very nicely to the preparation of a homogeneous pulp. Tried on a monkey there was produced a beautiful vaccinal eruption of the skin. L. T. GILTNER.

PURE CEREBRAL VACCINE VIRUS. VIRULENCE FOR MAN. Levaditi and Nicolau. Compt. Rend. Acad. Sci., vol. 174 (1922), p. 249.

In a series of tests it was shown that vaccine virus passed through rabbits by intracerebral inoculation for a period of eight months (110 passages) does not lose its affinity for the skin of man. Inoculated into the new-born, sucklings, and adults, it pro-

duces vesico-pustules similar to those of ordinary vaccine. There is no tendency to generalization and the vaccination is attended with no complications. It has the advantage over ordinary vaccine in being in a state of absolute purity without the addition of any antiseptic. Its virulence is quite constant, and its vaccinal properties are preserved for a long time either in the ice box, or at ordinary temperature. L. T. GILTNER.

REVIEW

VETERINARY HYGIENE. By R. G. Linton, M. R. C. V. S., Professor of Hygiene, Royal (Dick) Veterinary College, Edinburgh. One .volume of 429 pages, with 92 illustrations Published by William Wood & Company, 1921. Price, $6.00.

The author states that this publication "has been written in the hope that it will be of assistance to veterinary students, veterinary practitioners, and others concerned with the well-being of animals." The subject matter has been divided into 7 sections, as follows:

Section I.—Water.—36 pages.
Section II.—Meteorology.—13 pages.
Section III.—Sanitation.—26 pages.
Section IV.—Air and Ventilation.—34 pages.
Section V.—Building Construction.—83 pages.
Section VI.—Preventive Medicine.—180 pages.
Section VII.—Sanitary Law.—43 pages.

This recent work is one of the best that has yet appeared on the subject of hygiene, and it is evident that in preparing it the author has given special attention to certain branches of public health work with which veterinarians engaged in veterinary state medicine should be conversant.

Hygiene occupies a more conspicuous place than ever before in medical science. The trend of both human and veterinary medicine is toward prophylaxis and as we learn more of the etiology of diseases the more we are impressed with the importance of hygiene in livestock production. There appears to be no doubt that such a well written book on such an important subject will be welcomed by the veterinarians of the United States.

U. G. H.

ASSOCIATION NEWS

LOOKING TOWARD ST. LOUIS

Members of the Association who wish to be on the program for the fifty-ninth annual meeting of the A. V. M. A., to be held in St. Louis, August 28 to September 1, should get in touch with the various Secretaries of the different sections. It is especially desirable that practitioners should volunteer to present papers on subjects that will prove helpful to their colleagues in practice, as it is the desire of the Association officials to make the next convention a practitioners' meeting. The Secretaries of the sections are as follows:

Section on General Practice, H. E. Kingman, Ft. Collins, Colo.

Section on Sanitary Science and Police, H. Preston Hoskins, Box 471, Detroit, Mich.

Section on Education and Research, L. W. Goss, Columbus, Ohio.

MEETING OF A. V. M. A., ST. LOUIS, MO., TENTATIVE PROGRAM FOR 1922

Monday, August 28, Opening and General Session.

Monday evening, President's reception.

Tuesday morning, August 29th, section meetings.

Tuesday afternoon, General Session and election of officers.

Tuesday and Wednesday evenings there will be a Smoker and Round Table at the Planters Hotel, with entertainment.

Wednesday, August 30th, and Thursday, August 31st, there will be clinics both for large and small animals at East St. Louis. The large animal clinic will be in charge of Dr. H. E. Kingman, director, and Dr. F. L. Stewart, assistant director. Dr. J. C. Flynn will have charge of the Canine and Feline Clinic. At the Clinics a definite program is being arranged and each part will be carried out on a definite time.

On Thursday evening there will be sectional meetings and on Friday, September 1st, general sessions.

It is probable that the sections on Sanitary Science and Police and Education and Research will have programs at St. Louis while the clinics are being held at East St. Louis, so that those who are not interested in the clinics will have an opportunity of attending interesting sectional meetings.

N. S. Mayo, *Secretary.*

ELEGANT EMBLEMS

Dr. John F. McKenna, Resident Secretary for California, and one of the leading veterinarians on the Pacific Coast says: "I think the veterinary automobile emblems are excellent, and so does every other member that I have spoken to. Not only is it a well made emblem, but it is extremely reasonable in price."

Dr. McKenna ordered 68 automobile emblems in one lot for California veterinarians and more than 80 have been sent to veterinarians in that state. California is far ahead of any other state in the Union in securing these splendid emblems. Every member of the A. V. M. A. should have one of these emblems on his car. Send $1.25 to Secretary Mayo, and the emblem will be sent to you postpaid.

LIST OF APPLICANTS FOR MEMBERSHIP IN A. V. M. A. TO APRIL 1, 1922

Aghion, J. E. Bey	Princ. Vet. Officer	State Domains, Sakha, Egypt.
Arango, Ernesto	O'Reilly No. 77	Havana, Cuba.
Arias, Clodoaldo	R. Almendares	Marianao, Havana, Cuba.
Barbee, J. S.	400 New Centre Bldg.	Kansas City, Mo.
Barnes, W. S.	P. O. Box 252	West Palm Beach, Fla.
Bengston, J. S.	5740 So. May St.	Chicago, Ill.
Beaumont, E. V.	800 Live Stock Exchange	Kansas City, Mo.
Bilikan, L.	107 N. Tacoma Ave.	Tacoma, Wash.
Bogue, J. A.	901 Rhode Island St.	Lawrence, Kans.
Clark, G. A.	464 Bathurst St.	Toronto, Ontario, Can.
Crawford, A. B.	U. S. Exp. Station	Bethesda, Md.
Crawford, C. I.		Overbrook, Kans.
Dufresne, D. E.	65 Dickson Ave	St. Lambert, Quebec, Can.
Etchegoyhen, F.	Calle 25 No. 228 Vedado	Havana, Cuba.
Falk, R. W.		Canton, S. Dak.
Gladish, I. C.	Carlisle Barracks	Carlisle, Pa.
Hare, F.	Chief, B. A. I.	Haina, Santo Domingo, Dominican Republic.
Hart, C. E.	609 Archibald	Kansas City, Mo.
Hermann, A. A.	3854 Federal Blvd.	Denver, Colo.
Iduate, Angel	San Laxaro 212	Havana, Cuba.
Jardine, E. F.	Bassaterre	St. Kitts, British West Indies.
Kleinschmidt, H. R.		Merrill, Wis.
Alton, A. L.		Portage la Prairie, Man.
Lentz, J. B.	Mass. Agric. College	Amherst, Mass.
Manrique, A.	Apartado 8320	Mexico, D. F.
Marsh, H. E.		Cooperstown, N. Y.
Melvin, F. H.	P. O. Box 464	Albuquerque, N Mex.
Mitchell, J. J.	Dept. of Agriculture	Lansing, Mich.
Mockford, J. P.	2702 Bowland St.	Greenville, Tex.
Niederauer, J. P.		Pierre, S. Dak.
Phipps, L. H.		Winnebago, Minn.

Pozo, Jose del	Jardin Carlos Pacheco No. 11	Mexico, D. F.
Reagor, H. A.	940 West Lincolnway	Kearney, Neb.
Saint, F. F.	1721 2d Ave. N. W.	Calgary, Alta., Can
Scheibler, J. W.	994 Madison St.	Memphis, Tenn.
Sperry, J. R.	Off. of Vet., Schofield Barracks	Honolulu, H. T.
Thurber, G. W.		Loyal, Wis.
Turner, W. E.		National Stock Yards, Ill.
Warner, S. W.	464 Bathurst St.	Toronto, Ontario, Can.
Wiest, S. W.	P. O. Box 216	Santa Fe, N. Mex.
Wilkins, H. F.	1015 5th Ave., South	Lewistown, Mont.

VETERINARY MEDICAL ASSOCIATION OF NEW YORK CITY

The regular monthly meeting of the Veterinary Medical Association of New York City was held in the Veterinary College Building, New York City, on Wednesday evening, February 1, President R. S. MacKellar presiding. The minutes of the January meeting were read and approved.

Dr. Chas. H. Higgins was the first speaker of the evening. His subject was "Specific Therapy." As an introduction he said we are fortunate that with our present knowledge of many of the infectious diseases of animals we are in a position to combat these infections much more readily than is the case with the diseases of humans; that we have repeatedly demonstrated the possibility of complete eradication of infectious diseases in animals, as for instance contagious pleuro-pneumonia and foot-and-mouth disease in the United States and glanders in Canada.

The latter was eliminated by Dr. Rutherford at a cost to the Canadian Government of $1,500,000. At the present time a very vigorous campaign is being conducted throughout the country for the eradication of tuberculosis through the accredited-herd plan. Although contagious abortion was a vexatious problem, he hoped that with a live vaccine we would be able to control it, as was being done successfully in Great Britain.

A lively discussion in which a large number of members took part followed. Dr. Reid Blair said that glanders was well under control in New York City; that he had destroyed but 70 cases in the past year, whereas fifteen years ago he destroyed as many in two weeks. Dr. McKim asked Dr. Higgins about the tuberculosis situation in Canada. The latter said the disease was still rampant, but that a lot of work was being done

on the accredited-herd basis. The idea is that the Federal government should undertake the original weeding out process and then turn the work over to the local practitioner.

Dr. Bruce Blair reported several interesting cases in dogs. A four-months-old Boston terrier puppy was noticed getting fat rapidly for two weeks. Constipation, dull mucous membranes, pale, shallow respirations. Diagnosis: Hydro-peritonitis. Two quarts of fluid was drawn and digitalin was given. A few days later the dog was destroyed. On post-mortem two pints of fluid was found in the abdomen, heart was three times normal size, but the valves were normal.

Eight-year-old Aberdeen terrier bitch was supposed to be pregnant. Three days before delivery a black discharge was noted from vulva and the abdomen was hard and tense. Diagnosis: Pyometra. Operated on and uterus removed, with slow successful recovery.

Four-year-old mongrel male, 15 pounds, appeared dull and constipated. Vomiting was frequent and mucous membranes were discolored. Diagnosis: Jaundice. Animal was given glycerine, salol and arecoline. Recovery took place in eight days.

Dr. Reid Blair said that in the diagnosis of pregnancy the young practitioner should always be on his guard for pyometra, especially in old bitches. He also mentioned the value of arecoline for tapeworms in dogs, one-fourth grain for large and one-eighth grain for the smaller breeds, given by the mouth.

Dr. Slawson said he had been interested in pyometra cases for some time and had some success with injections of 10 c.c. leucocyte extract. He advises operation and removal of uterus as the best procedure. Dr. Slawson exhibited a pathological specimen of liver and spleen from a Boston terrier. The dog was presented for examination about November 1. History revealed lack of appetite, losing strength, vomiting and emaciation. On palpation he could feel what appeared to be a tumor in abdomen. He advised an exploratory operation, which was refused. The dog got gradually worse and was chloroformed on January 2. Post-mortem showed liver twice the normal size and spleen fourteen times normal size. The specimens were sent to Dr. Ewing's Laboratory for examination. Diagnosis:

Endothelial carcinoma which is common in human subjects, but never had seen it in dogs before.

Dr. Cassius Way gave an interesting report on the conference recently held at Ithaca.

Dr. Gannett asked if the canine practitioners had found nephritis common in dogs, as he was having quite a number of cases in his practice lately. Dr. Blair said it was a common disease in house dogs and is usually due to overfeeding, without sufficient exercise. Sometimes it occurs as a complication following distemper. He found the best treatment to be sanmetto, with liberal quantities of olive oil. A number of cases clear up and recover permanently under his treatment.

Dr. Altman asked what should be the attitude of a practitioner called by a client to examine a sick dog during the progress of a dog show. The consensus of opinion was that the doctor was acting properly in responding and making his examination.

It was regularly moved, seconded and carried that a rising vote of thanks be extended to Drs. Higgins and Blair for their contributions to the program of the evening.

J. ELLIOTT CRAWFORD, *Secretary.*

ALABAMA VETERINARY MEDICAL ASSOCIATION

The fifteenth annual meeting of the Alabama Veterinary Medical Association was called to order February 23, by the President, L. E. Beckham, in the College of Veterinary Medicine, at the Alabama Polytechnic Institute, Auburn.

Following the President's address and the report of the Secretary-Treasurer, L. L. Denson read a paper on the amputation of the supernumerary teats in cows. He described the cautery method and the flap method. E. T. Davis next described the method of draining the sinuses of the head in cattle. Each sinus was described individually and the proper method of drainage by the trephine, etc., was brought out. A. A. Miller then described certain parasites and gave the life history of the parasites that are found in the sinuses of sheep and goats.

J. L. Miller read a paper on "The Dog as a Primary Host of Parasites." He confined his paper largely to the round and flat worms found in the alimentary canal. E. Everitt next described

the principal round and flat worms found in the digestive tract, and the round worms found in the trachea of chickens. He gave definite methods of diagnosis and treatment and related his experience in using various drugs, such as oil of chenopodium.

Following this H. C. Wilson, federal veterinarian on hog cholera work in Alabama, described his method of injecting serum directly into the peritoneal cavity. He also told how he controlled "breaks" and quoted Dr. Niles, who stated that 90 per cent of hog diseases was cholera.

H. S. Stewart gave a paper on the life history of *Ascaris lumbricoides* as found in pigs.

The night meeting was confined to a general discussion of the business transactions of the veterinarian in practice. It was very interesting and profitable.

The morning of February 24, R. S. Sugg read a paper on "Anthrax Problems." He told how anthrax germs in smears of blood dried on glass and smooth paper, in the sun and sometimes in the shade, soon lost their vitality. This is due to the fact that the mature anthrax germs die before they form spores. He directed that the blood from the anthrax carcasses be collected early after death, and small pieces of gauze be rolled up and the blood taken up by it like blotting paper. This should be allowed to dry slowly and then put into a container—not air tight—plugged with cotton; then put in a secure mailing box and ship to the laboratory. He also stated that it was impossible to make an accurate diagnosis with smears alone. It is necessary to make culture and inoculation tests in order to be positive. It should be noted here that this method of collecting blood diagnosis does not apply to hemorrhagic septicemia. Dr. D. J. Meador discussed this paper and told how he had controlled an extensive outbreak of anthrax on an open range by burning carcasses very promptly after the death of the animals. This prevented flies and dogs and buzzards from distributing the infection and also destroyed infection. He also stated how the Oklahoma State authorities prohibit the indiscriminate use of anthrax vaccine. In no case is it permissible to use it until a positive diagnosis has been made by a State or federal authority.

Dr. E. R. Miller, Chemist, gave a short talk on some peculiar cases of chemical poisons. Arsenate of lead was suspected, but

neither lead not arsenate could be found in tissues. intestines or stomach; but sulphur and lime were found in abundance, and he attributes the toxic effect to hydrogen sulphide and sulphite and calcium sulphide or sulphite.

Major I. Spalding, of U. S. Army, next gave a short talk on feeding horses and mules in the Army. Dr. N. G. Coving read a paper on "Botulism in Man and Animals." He gave the history of botulism and reported records of outbreaks in man and discussed the disease in general in animals. The important point he brought out was that the toxin of botulism was not developed in animals but in the foods before the toxin was taken into the animals.

"Why do Hogs Thump," was discussed by Dr. W. D. Staples. He said this is a symptom which was in reality a spasmodic contraction of the diaphragm, due to a toxic or some other irritant of the nerves and muscles of the diaphragm. He said also, that it was often a symptom found in pneumonia, indigestion and lung parasites.

The intradermal tuberculin test was discussed in full by Dr. C. P. Gaston, the ophthalmic test by Dr. T. M. Dennis, and the combination test by Dr. C. J. Becker. Dr. I. S. McAdory then read a paper on the location of the lymph glands in cattle and in hogs. This was followed by a discussion on the lymph glands that are most frequently involved in tuberculosis in hogs and in cattle.

Following this a general review was taken of the State and federal laws and regulations governing tuberculosis in domestic animals. The election of officers was then held which resulted as follows:

Dr. D. J. Meador of Selma, President.

Dr. R. S. Sugg of Auburn, Vice President.

Secretary-Treasurer, Dr. C. A. Cary, Auburn.

A special committee reported on the methods of the Veterinary Supply Co., of Kansas City. This report was adopted by a unanimous vote of the association. The resolution or report read as follows:

Whereas, it has come to the attention of the Alabama Veterinary Medical Association that the American Veterinary Supply Company, whose officers are Dr. A. Trickett, Dr. C. F. Jungerman and Dr. R. E. Naylor, members of the American Veterinary

Medical Association, is advertising by circular letter and catalogue that for the past twelve years they have sold to veterinarians only, but they have now changed their policy and in the future will sell to laymen direct; therefore be it

Resolved, That we, the members of the Alabama Veterinary Medical Association, do heartily condemn and disapprove of such methods.

Resolved, That a copy of this resolution be spread upon the minutes of this association and that a copy be sent to the secretary of the American Veterinary Medical Association for publication in the JOURNAL.

W. D. STAPLES.
D. J. MEADOR.
W. B. FLEMING.

On the night of February 24, the Student Veterinary Medical Association of the Alabama Polytechnic Institution gave a banquet to the members of the Alabama Veterinary Medical Association and visitors. This banquet was produced by the Local Order of the Eastern Star. It was a most delightful and entertaining evening.

On the morning of February 25, the B. A. I. and the State authorities gave an examination to graduate veterinarians who wished to be granted permission to test accredited herds. On the same day a polyclinic was held at the A. P. I. College of Veterinary Medicine. A number of cases were examined and diagnoses made. A grade Holstein heifer that had given tuberculin reaction was killed at the serum plant slaughterhouse and a postmortem was held for the benefit of the students and the veterinarians present. This was a case of generalized tuberculosis in which a large number of body and visceral glands were infected, but there was very slight infection in the lungs and no apparent infection in the kidneys. A very distinct lesion extended from the iris out through the cornea of the right eye. This heifer was only two years old and came from a tuberculous herd.

C. A. CARY, *Secretary.*

IDAHO VETERINARY MEDICAL ASSOCIATION

The old "Association of Veterinary Graduates" in Idaho is a defunct organization, and the new association wishes to appear in the "Directory of Associations" in the A. V. M. A. JOURNAL, under the new association name, the "Idaho Veterinary Medical

Association.'' The place of meeting is at Boise, Idaho, in January, 1921, and each alternate year thereafter. The following alternate years, the annual meetings are to be held at some place in north Idaho. The secretary, at the present time is J. D. Adams, 417 Union St., Boise Idaho.

By way of explanation, it should be stated that the old association had not functioned for years and in order to reorganize, it was thought best to incorporate under a new name. In November, 1919, a preliminary meeting was held, at which meeting a new association was organized and incorporated under the laws of Idaho as the Idaho Veterinary Medical Association. The officers of this association shall be graduates from accredited colleges recognized by the A. V. M. A. and licensed to practice their profession within the State.

The first annual meeting of this association was held in Boise, Idaho, January 26 and 27, 1921, attended by nearly all the graduate veterinarians in the State, and a splendid program was presented.

At this first annual meeting it was unanimously agreed that the 1922 annual meeting should be held jointly with the Oregon and Washington Veterinary Associations at Pullman, Washington, the first part of this year, the date to be set at a later time. However, on account of the general depression in the livestock industry, which of course, otherwise involves the prosperity of the practicing profession, the joint meeting could not be arranged. On account of not being able to have the regular annual meeting as arranged, the President, in accordance with Article XII, Sec. 2, has called this annual meeting to be held in Boise on May 11, for the purpose of transacting the regular business of the Association and presenting a short program.

J. D. ADAMS, *Secretary.*

SOUTHEASTERN STATES VETERINARY ASSOCIATION

The sixth annual meeting of the Southeastern States Veterinary Medical Association was held at the Hermitage Hotel, Nashville, Tenn., March 13 and 14, 1922. The association enjoys the distinction of having 221 members; thirty-one new ones joined in Nashville. Notwithstanding this, the Secretary is embarrassed

by some members who neglect to keep their dues paid up. A little matter of $2.00 should not prevent any qualified man from meeting such obligations.

The program was efficiently and neatly prepared and contained the names of several specialists. These men came a long distance to render service, while some others nearer to Nashville whose names appeared on the program did not attend. It must never be forgotten that unless people at home manifest a keen interest in their welfare, outsiders will not. The Southeastern States Association should grow into a powerful and useful organization and be one of the strongest allies of the A. V. M. A.

The banquet and business session was held in the grill room of the Hermitage Hotel; the food and service were splendid. After the repast keen interest was manifested in the election of officers. The session was well attended and it is difficult to estimate whether it was the banquet or the election of officers which commanded such a large attendance.

On Wednesday afternoon a very interesting and instructive session was held at one of the large near-by dairy farms. Contagious abortion was the subject under discussion. The demonstrations were exceedingly skillful and should impress every veterinarian with the necessity of detail.

Two days were well spent and each member appeared to enjoy the occasion. The association was treated so well in Tennessee, it was decided that the next meeting would be in Chattanooga.

E. I. SMITH, *Recorder.*

ONTARIO VETERINARY COLLEGE

Dr. C. D. McGilvray, Dean of the Ontario Veterinary College, has just issued a new prospectus for the college, announcing its removal from Toronto to Guelph, in connection with the Agricultural College of Ontario.

Dr. McGilvray also has an excellent article, giving the opportunities that the veterinary profession offers to young men.

Dr. McGilvray is optimistic for the future of the veterinary profession, and we feel sure that under his able administration the Ontario Veterinary College will not only uphold its splendid record, but improve upon it.

NEBRASKA EXAMINATION

The Nebraska State Board of Examiners of Veterinary Medicine will hold their next regular examination in Lincoln, June 15. Applications should be on file not later than June 1. For information and applications, address H. H. Antles, Secretary, Department of Public Welfare, State House, Lincoln, Neb.

H. H. ANTLES, *Secretary.*

ILLINOIS VETERINARIANS GOING TO ST. LOUIS

At a recent conference of Illinois veterinarians held at Monmouth, Ill., it was officially decided not to hold the usual "bumper" meeting of the Illinois State Veterinary Medical Association in midsummer this year, but to use instead all the efforts of the members to increase the attendance of the A. V. M. A. annual meeting in St. Louis, from August 28 to September 1, inclusive. This courteous action will be deeply appreciated by the A. V. M. A. and we are assured that the Illinois veterinarians will go to St. Louis with a big representative delegation and many prospects for new members.

MORGAN HORSE CLUB HONORS STURDY MOUNT

The Morgan Horse Club of America has honored Castor, an 800-pound resistered Morgan horse bred and owned by the Government, by issuing a booklet telling of his remarkable sturdiness and endurance. Castor was one of the few horses to finish the United States Mounted Service Endurance Test of 300 miles, held last October.

During the test Castor carried 245 pounds, nearly one-third of his weight, without developing any leg trouble. His loss of only 12½ pounds during the five-day test was a remarkable part of his performance, especially considering the fact that he was by far the smallest horse in the contest.

The booklet published by the Morgan Horse Club is entitled "Morgan Horse Wins Laurels in Mounted Service Endurance Test, 1921."

COMMUNICATIONS

DIAGNOSIS QUESTIONED

To the Editor:

The case report on "Swine Erysipelas," by J. C. Quinlan, San Francisco, California, appearing on page 781 of the issue of the Journal for March, 1922, attracted the close attention of the writer because it contained the statement: "I took samples of the urine and a spleen to two different laboratories—one of them Letterman General Hospital at Presidio—and they both found the bacillus of rouget plentiful in the urine."

Desiring a culture, I wrote the Hospital, and have received the following from the Chief of Laboratory Service:

March 22, 1922.

Dr. A. R. Ward,
Goshen, N. Y.

Dear Sir: The culture in question was not preserved in this laboratory. This laboratory reported the organism as *B. suisepticus*, and forwarded a subculture to the Army Medical School, Washington, D. C., from which a confirmatory report was returned.

Very respectfully,

E. G. Huber,
Major, Medical Corps, U. S. A.,
Chief of Laboratory Service.

So far as the Letterman General Hospital is concerned the writer of the case report in question has introduced false bacteriological evidence to support his diagnosis. The pathology and etiology of swine diseases are complicated enough without the presentation of case reports of this character.

A. R. Ward.

ETIOLOGY OF LOSS OF MEMBERSHIP

To the Editor:

In a recent editorial, *Veterinary Medicine* (December, 1921), states: "* * * with keen regret that the A. V. M. A. is on the toboggan for the first time in its history * * *." This editor's conclusion that increasing the salaries of the officers of the A. V. M. A. and the toboggan are etiologically related is open to question.

From a recent report of the Secretary of the American Chemi-

cal Society for the year ending December 31, 1921, published in the February, 1922, number of the *Journal of the American Chemical Society*, we find that the paid membership dropped from 11,623 to 10,679, or almost one thousand in a single year. There were no increases in salaries of officers. The loss in membership—the first in twenty years—is attributed by the Secretary to the industrial depression, high costs, etc.

One of the high costs frequently overlooked is the high cost of book binding. The dues in the American Chemical Society are $15 per year, for which three journals are supplied. To bind these at present prices costs an additional $9.00 at least.

It is obvious that when societies like the American Chemical Society lose membership—and this society does not seem to stand alone—a corresponding loss in the A. V. M. A. membership is not necessarily a grave symptom.

W. N. BERG.

FROM RESIDENT SECRETARY FOR IDAHO

TO THE EDITOR:

It was officially announced in the February number of the A. V. M. A. JOURNAL, that I have been designated Resident Secretary for Idaho.

This signal honor, of being favorably considered by the members of this great association of men of my profession, and especially by the members of this district, is hereby acknowledged with appreciation.

I wish to express my thanks to the district representatives, the Executive Board, and especially to the fellow members in Idaho, and may their confidence in me prove to be not misplaced by any activity or inactivity of mine while acting as their secretary.

The By-Laws state that, "Each Resident Secretary shall cooperate with the Committee on Intelligence and Education and shall aid the President, Secretary, and Editor of the JOURNAL in such a manner as they may direct." I assure you that it will be my earnest purpose and my desire to give the association officials, at all times, the most hearty cooperation and shall not be unmindful of my obligations to the fellow resident members in Idaho.

Our National Secretary has already announced that an active campaign to increase the membership of the A. V. M. A. is to be made immediately, that the next meeting of the association will be held in St. Louis, Mo., August 28 to September 1, and that we are going to make this the biggest and best year the A. V. M. A. has ever had. Let us see to it that the Idaho membership shall not be found lagging in its support to our National Organization.

Our National President, Doctor Kinsley, has made a most noteworthy step, it would seem, in appointing a Special Committee "to consider plans for a closer affiliation between the A. V. M. A., and the State Local Veterinary Organizations." The accomplishing of this "closer affiliation" to my mind, will be the outstanding feature in the future development and advancement of the association. Let us hope that this will be a "Mighty Busy Special Committee."

J. D. ADAMS, *Resident Secretary for Idaho.*

ARE YOU GOING TO CALIFORNIA IN JUNE?

TO THE EDITOR:

During the first week of June—to be specific, the 5th, 6th and 7th of June—the California State Veterinary Medical Association's annual meeting will be held in Los Angeles. I have been informed that during the same part of June the Shrine Convention is to be held in San Francisco and the Rotary Club annual meeting in Los Angeles.

I have been selected by the President of our association, as Chairman of the Arrangements Committee for this meeting, and it has occurred to me, since both of the above mentioned conventions are to be held at approximately the same time, there might be an opportunity to produce for our program some veterinarians from the East, who might be coming here for one or the other. I would very much appreciate if you would make the above information a news item to appear in an early number of the JOURNAL, and would thank you for any suggestions that you might have along the lines above mentioned, as we are desirous to make this the best state meeting ever held in California. J. P. BUSHONG, *Secretary.*

NECROLOGY

Dr. Arthur M. Perry, Inspector of the Bureau of Animal Industry, died at Omaha, Nebraska, September 29th, 1921, following an attack of appendicitis.

Dr. Perry was born at Van Wert, Ohio, December 10th, 1883, and graduated from the Cincinnati Veterinary College in 1916. He engaged in practice until appointed a veterinary inspector in the Bureau of Animal Industry in 1917. Dr. Perry joined the A. V. M. A. in 1918. At the time of his death he was Supervising Inspector at one of the large establishments at Omaha.

Dr. Perry leaves a wife and one daughter to mourn his early demise. He was a home loving man, a devoted husband and a kind father.

Dr. Charles H. McVeigh, of Hanna, Alberta, died on January 2, 1922, after a long illness. He was an Inspector of the Health of Animals Branch, having been appointed to the Field Division July 1, 1907, and worked continuously in the Province of Alberta.

Doctor McVeigh was a graduate of the Ontario Veterinary College in the year 1900, and joined the A. V. M. A. in 1921.

The end of a long and honorable career came when Dr. J. A. Couture died on March 12. Born in 1850 he was one of the first graduates of the Montreal Veterinary College. A member of a large family, it was necessary for him to fend for himself, and his early struggles and privations in obtaining his professional training would have discouraged a less determined and forceful character.

Entering the service of the Department of Agriculture in 1884, he was a diligent and faithful employee up till the time of his death. He held the very responsible position of Superintendent of the Animal Quarantine Station at Levis, and it was owing to his vigilance on more than one occasion that Canada escaped visitations of foot and mouth disease and contagious pleuro-pneumonia, both of which made their appearance in ani-

mals undergoing quarantine, but were prevented from extending beyond the quarantine.

Dr. Couture was a sincere friend to the farmers and stock-breeders of the Province of Quebec. He wrote much on agricultural subjects for the French press, and as Secretary for the Live Stock Breeders' Association was a powerful agent in improving the livestock of the country. He was greatly interested in the movement that resulted in establishing a system of records for the French Canadian breeds of horses and cattle, and did all he could to improve them.

In private life a devoted father, a devout adherent of the Roman Catholic Church, a faithful friend, he will long be mourned by the very large number who knew and loved him. The Health of Animals Branch loses one of the oldest members of its staff, and sadly brings its offering of regret to lie beside so many others on his grave. F. T.

Mrs. Laleopoldina Schwarzkopf, wife of Major Olaf Schwarzkopf, U. S. Army, retired, died at Hotel Stolzenfels, Capellen, Germany, on April 7.

Mrs. Schwarzkopf had been in declining health for a number of years. Major and Mrs. Schwarzkopf came to Germany last November and have been living at Capellen. Mrs. Schwarzkopf will be remembered, for her charming personality. She was born in Budapest, Hungary, sixty-five years ago and had lived in the United States since 1884. Most of Major Schwarzkopf's service as Veterinarian in the Army was with the 3rd U. S. Cavalry. Funeral services were held at Capellen and burial took place at the cemetery there.

In the recent deaths of Prof. Sir G. Sims Woodhead and Prof. Sheridan Delepine, the British medical profession has lost two of its eminent research workers and public health authorities who were well known also in the veterinary world because of their studies of tuberculosis and their cooperation with the veterinary profession. Both were officially connected with the Royal College of Veterinary Surgeons.

MISCELLANEOUS

DR. HICKMAN RETIRES

Dr. Richard W. Hickman, Chief of the Quarantine Division, resigned on March 31, on which date he completed thirty-four years of continuous public service in the Bureau of Animal Industry.

Dr. Hickman was appointed a veterinary inspector March 31, 1888, on the force of Dr. W. S. Devoe at Philadelpria, which was organized to combat contagious pleuropneumonia in that vicinity. On December 11, 1888, he was transferred to the force operating in the vicinity of New York City, where the disease was most prevalent. On account of his energy and his skill as a diagnostician, he was conspicuous among those veterinarians who under very unfavorable conditions accomplished so successfully the first great task assigned to the new Bureau, the eradication of contagious pleuropneumonia from the United States. As a result of this accomplishment, the ports of Great Britain were reopened to our export cattle trade, and Dr. Hickman was sent to the Union Stock Yards, Chicago, our greatest export cattle market at that time, to organize a system for inspecting and marking export cattle for identification. On May 1, 1892, he was placed in charge of the meat inspection station at New York City, where he remained until he was called to Washington November 1, 1900, to take charge of the Miscellaneous Division of the Bureau. On July 1, 1905, he was appointed Chief of the Quarantine Division, which under his able direction for seventeen years has proved an effectual barrier against any invasion of such destructive foreign plagues as contagious pleuropneumonia, foot-and-mouth disease, surra, rinderpest, nagana, Malta fever, mal de caderas and cattle farcy.

Dr. Hickman was ably prepared for the important responsibilities to which he was assigned; he had a thorough training at the Veterinary School of the University of Pennsylvania, where he graduated in 1887, and thirteen years of varied veterinary experience in field work before he came to Washington, and was also an experienced pharmacist. While in charge of the meat inspection work for the Bureau in New York City, he was appointed in 1894 to the chair of cattle pathology in the New

York College of Veterinary Surgeons, and in 1899, when the New York College of Veterinary Surgeons and the American Veterinary College were amalgamated with the New York University, he was appointed professor of cattle pathology and meat inspection and a member of the governing faculty.

It was largely due to Dr. Hickman's knowledge of pharmacy that he was selected in 1920 as an alternate to represent the veterinary profession at the Decennial Convention for the revision of the U. S. Pharmacopoeia. In March, 1909, he was selected as a member of the Bureau Committee to inspect the veterinary colleges of the United States with the view of formulating regulations in cooperation with the U. S. Civil Service Commission governing entrance to civil service examinations for the position of veterinary inspector in the Bureau of Animal Industry.

It is difficult for those who have been associated with Dr. Hickman for twenty years or more to realize that he has reached the retirement age. He may justly feel proud of his thirty-four years of faithful, efficient service. He always gave the best he had and that best was of a high order. He met many strangers in the performance of his official duties and always made them friends, as his attitude toward others is generous and sympathetic.

Dr. Hickman is in splendid physical condition to enjoy the long vacation to which he is so justly entitled, and his many friends in the veterinary profession and everywhere wish him many years of happiness.

PRECAUTIONS AGAINST INTRODUCTION OF FOOT-AND-MOUTH DISEASE

The Minister of Agriculture, Provisional Government, has issued the following notice:

"At each port in Ireland where people land from vessels arriving from Great Britain, provision is made for the disinfection of persons (and their clothing), who have been employed in connection with the buying, shipping, or unshipping of animals in Great Britain, and any other person who is likely to have been in contact with animals on board ship in transit, or in any part of Great Britain.

"The present outbreak of foot-and-mouth disease in Great Britain has reached alarming dimensions, and the disease is of a highly virulent type. The malady may, at any time, extend to this country. The actual manner in which the disease is conveyed from place to place is not obvious, but it is known that persons who have been in contact with animals affected with this disease may, especially through the agency of their clothes, including their boots, carry the disease, and infect healthy stock. This explains the reason for requiring all persons in contact with animals in Great Britain to disinfect themselves and their clothing on arrival in Ireland, and it is essential that this process of disinfection should be rigidly observed, having regard to the continuous movements of people engaged in the livestock trade between Ireland and Great Britain.

"When returning to Ireland after their transactions in the disposal of animals, it is known that sometimes the clothes and boots worn by persons when actually engaged with animals or in places where animals are, are not those worn by such persons on their arrival in Ireland. These clothes may be brought with them in bags. It is, therefore, very necessary that this portion of their wearing apparel—including boots, hats, caps, etc.—should be produced for disinfection at the ports of entry into Ireland.

"Further, persons engaged in the Irish Cross-Channel livestock trade should, as far as possible, avoid the districts where the disease exists in Great Britain. They may not actually themselves be in contact with affected animals, but their clothes or boots may come in contact with material or persons which have been on places where such disease has existed and become themselves carriers of the infection in this manner.

"The entry of hay and straw into Ireland from Great Britain is prohibited, except under license, and no license has or will be granted until all danger has passed. Hay or straw may, however, arrive in this country as packing material and as manufactured articles, and any order prohibiting such entry would result in a serious disturbance of trade, and be difficult, if not actually impracticable to give effect to. Packing material of the kind frequently arrives in enclosed packages there being no outward indication of what class of packing material is being used for the contents of such packages, and it would be an ex-

tremely difficult process to trace all packages of the kind to their destinations throughout the country, where examination of the contents could be made.

"It is, therefore, urged that as soon as possible, after unpacking, such packing material be at once burned, and not under any circumstances be sold or used in connection with animals.

"Notwithstanding the many references to the present outbreak of foot-and-mouth disease in Great Britain having originated in this country, the livestock of Ireland still remains free from the malady, but it is essential that owners of livestock should daily examine their animals, and if they find any suspicious affection of the feet and mouth, the matter should be at once reported, in order that immediate steps may be taken to investigate the case.

"Vigilant examination, always of the greatest importance in a case of suspected foot-and-mouth disease, is now of special urgency, and it is suggested that in order to make the search more effective, County Committees of Agriculture, local branches of Farmers' Unions, Co-operative Societies, etc., should come together, adopt and put into operation measures designed with this object, and cooperate with the officers of the Department of Agriculture. During the County Wicklow outbreak last year, this cooperation was forthcoming, and the support so given effectively aided in stamping out the disease in that county."

From *The Irish Homestead*, March 4, 1922.

"The Problem of Foot-and-Mouth Disease" is the title of a review of the situation as it prevails in England, with a diagnosis of the disease, by Prof. W. R. Simpson, C. M. G., in *Country Life* (London). In this the author says: "Notwithstanding the strenuous efforts of the Agricultural Department, the epidemic of foot-and-mouth disease has inflicted a considerable loss on the country. This is not surprising in view of those efforts having unfortunately been handicapped by the very infectious nature of the disease, by its catholicity in attacking other animals besides cattle, and by the fact that the infective and causal agent of the disease has not been discovered, as has been the case in many of the other infectious diseases."